



WESTERN SURGICAL ASSOCIATION

2016 Annual Scientific Session

Saturday through Tuesday
November 5–8, 2016
Loews Coronado Bay Resort
Coronado, California

Final Program

**The Western Surgical Association
would like to thank the following company
for their generous support of our meeting
through educational grants:**

Medtronic

**The Western Surgical Association
would like to thank the following exhibiting
companies for their generous support:**

3D Systems

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Western Surgical Association

**2016 ANNUAL
SCIENTIFIC
SESSION**

**Saturday through Tuesday
November 5–8, 2016
Loews Coronado Bay Resort
Coronado, California**

WESTERN SURGICAL ASSOCIATION MISSION STATEMENT

The Western Surgical Association is dedicated to the cultivation, promotion, and diffusion of the art and science of surgery, to the sponsorship and maintenance of the highest standards of practice and to the delivery of the best possible care for the public. The goal of our continuing medical education effort is to provide information to the practicing surgeon that will enhance his/her knowledge regarding new diagnostic modalities and therapeutic maneuvers. The scope of our activities is meant to encompass the breadth of general surgery, including the primary and secondary components and is intended for our members and guests who are surgeons in academic and private practice. Our activities will focus on recent advances in basic science applicable to surgical practice, new developments in technology, issues in pre- and post-operative care; assessment of diagnostic accuracy and surgical outcomes; and critical analysis of the information provided.

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LOCATION

Loews Coronado Bay Resort
Coronado, California

REGISTRATION

Location: Atrium

Saturday, November 5	3:00pm – 6:00pm
Sunday, November 6	6:00am – 12Noon
Monday, November 7	7:00am – 5:00pm
Tuesday, November 8	7:30am – 11:30am

SCIENTIFIC SESSIONS

Location: Commodore C/D

Sunday, November 6

7:00am – 9:10am	Scientific Session I
9:20am – 10:20am	Scientific Session II

Monday, November 7

8:00am – 10:20am	Scientific Session III
10:30am – 12:10pm	Scientific Session IV
12:30pm – 1:30pm	WSA Video Session
3:45pm – 4:15pm	Quick Shot Presentations

Tuesday, November 8

7:30am – 9:20am	Scientific Session V
9:50am – 11:15am	Scientific Session VI

MEETING OBJECTIVES

1. Delineate the importance of new diagnostic and therapeutic modalities in surgery.
2. Prioritize treatment of surgical diseases with new operative and non-operative technologies and treatment options.
3. Elucidate the outcome of new surgical procedures and novel adjuvant therapies.

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 Western Surgical Association. The American College of Surgeons is accredited by the ACCME to provide continuing medical education for physicians.

AMA PRA Category 1 Credits™

The American College of Surgeons designates this live activity for a maximum of **15.50** *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 **11.00** credits meet the requirements for Self-Assessment.



AMERICAN COLLEGE OF SURGEONS
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Highest Standards, Better Outcomes*



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

DISCLOSURE STATEMENT

In compliance with 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 see the insert to the program for the complete list.

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MEMBERSHIP CANDIDATES ELECTED TO MEMBERSHIP AT THE ANNUAL MEETING NOVEMBER 2016

The Western Surgical Association Welcomes its New Members and their Spouses

Mark Dobbertein
US Navy

Melanie Goldfarb
John Wayne
Cancer Institute

Kamran Idrees
University Of Pittsburgh
Medical Center

Scott Kelley
Mayo Clinic

Anil Kotru
Geisinger Medical Center

C. Neal Ellis
Texas Tech University

Gary Vitale
University of Louisville

Jason Wellen
Washington University
School of Medicine

Paul Wise
Washington University
School of Medicine

Chip Woodall
Cox Health

Yun Shin Chun
University of Texas, MD
Anderson Cancer Center

Carlos Rodriguez
Spectrum Health

Medical Group
Charles St. Hill
University of Nevada
School of Medicine

Christina Roland
University of Texas, MD
Anderson Cancer Center

Martin Schreiber
Oregon Health &
Science University

Erica Sutton
University of Louisville

Gary Vercruysse
University of Tucson

Krista Kaups
University of California
San Francisco

Eric Ley
Cedars-Sinai
Medical Center

Michele Ley
University of Arizona

Julie Margenthaler
Washington University
School of Medicine

Erin Maynard
Oregon Health & Science
University

Matthew Mutch
Washington University

School of Medicine

Nicolas Ajkay
University of Louisville

Christopher Anderson
University of Mississippi

Bryan Clary
University of California
San Diego

James Davis
University of California
San Francisco

Stephen Haggerty
University of Chicago

Benjamin Jarman
Gundersen Health System

Bellal Joseph
University of Arizona

Eleni Tousimis
Georgetown Lombardi
Cancer Center

**WSA 2015
NEW MEMBER**
*(receiving New Membership
Certificate at the WSA 2016
Annual Meeting)*

Eugene Ceppa
Indiana University
School of Medicine

OFFICERS – 2016

PRESIDENT

R. James Valentine
Nashville, Tennessee

1ST VICE PRESIDENT

Thomas H. Cogbill
LaCrosse, Wisconsin

2ND VICE PRESIDENT

Vijay K. Maker
Chicago, Illinois

SECRETARY

Leigh A. Neumayer
Tucson, Arizona

TREASURER

Mark S. Talamonti
Evanston, Illinois

RECORDER

Kelly M. McMasters
Louisville, Kentucky

EXECUTIVE COMMITTEE

PRESIDENT

R. James Valentine
Nashville, Tennessee

1ST VICE PRESIDENT

Thomas H. Cogbill
LaCrosse, Wisconsin

2ND VICE PRESIDENT

Vijay K. Maker
Chicago, Illinois

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Mark S. Talamonti
Evanston, Illinois

RECORDER

Kelly M. McMasters
Louisville, Kentucky

IMMEDIATE PAST PRESIDENT

William C. Chapman
St. Louis, Missouri

PAST PRESIDENT

Steven C. Stain
Albany, New York

DISTRICT REPRESENTATIVE

Anees B. Chagpar
New Haven, Connecticut

DISTRICT REPRESENTATIVE

Peter Rhee
Atlanta, Georgia

DISTRICT REPRESENTATIVE

Daniel R. Margulies
Los Angeles, California

DISTRICT REPRESENTATIVE

Margo C. Shoup
Warrenville, Illinois

OTHER REPRESENTATIVES

BOARD OF GOVERNORS, AMERICAN COLLEGE OF SURGEONS

Charles R. Scoggins
Louisville, Kentucky

AMERICAN BOARD OF SURGERY

David Farley
Rochester, Minnesota

ADVISORY COUNCIL ON SURGERY, AMERICAN COLLEGE OF SURGEONS

G. Edward Kimm, Jr.
Denver, Colorado

MEMBERSHIP COMMITTEE – 2016

Mark Faries - *Chair*
Thomas Aloia
Jayer Chung
Steven De Jong
Daniel R. Margulies
Margo C. Shoup
R. James Valentine, *Ex-Officio*
Leigh A. Neumayer, *Ex-Officio*
Mark S. Talamonti, *Ex-Officio*

PROGRAM COMMITTEE – 2016

Charles R. Scoggins - *Chair*
Anton Bilchik
Anees Chagpar
M.B. Majella Doyle
Peter Rhee
Carmen Solorzano
R. James Valentine, *Ex-Officio*
Leigh A. Neumayer, *Ex-Officio*
Kelly McMasters, *Ex-Officio*

LOCAL ARRANGEMENTS CHAIRMAN – 2016

Raul Coimbra
San Diego, California



Schedule of Events

SCHEDULE OF EVENTS

SATURDAY, NOVEMBER 5, 2016

8:00am – 12Noon **WSA Executive Committee Meeting** – Aurora

3:00pm – 6:00pm **WSA Registration Open** – Atrium

5:30pm – 6:30pm **New Member Reception** – Sunset Terrace

6:30pm – 8:30pm **WSA Welcome Reception** – Bay Terrace

SCHEDULE OF EVENTS CONTINUED

SUNDAY, NOVEMBER 6, 2016

- 6:00am – 7:00am **Continental Breakfast** – Commodore E
- 6:00am – 12Noon **Exhibits Viewing** – Commodore E
- 6:00am – 12Noon **WSA Registration Open** – Atrium
- 7:00am - 9:10am **Scientific Session I** – Commodore C/D
- 8:00am – 10:00am **Spouse/Guest Hospitality and Breakfast** – Sunset Terrace
- 8:45am **Introduction of WSA New Members** – Commodore C/D
- 9:00am **Presentation of 2015 “J. Bradley Aust Award” for Best Paper by a New Member** – Commodore C/D
Recipient: Jason W. Smith
University of Louisville
- 9:10am – 9:20am **Morning Beverage Break & Exhibits Viewing** – Commodore E
- 9:20am – 10:20am **Scientific Session II** – Commodore C/D
- 10:20am – 11:20am **WSA Presidential Address: “The Hidden Cost of Medicine”**
Commodore C/D
R. James Valentine, MD
Vanderbilt University School of Medicine
- 12Noon (*shotgun start*) **WSA Annual Golf Tournament** – Coronado Municipal Golf Course
- 1:00pm – 3:00pm **WSA Guided Wildlife Kayak Tour**
Departs from Excursion/Marina Dock adjacent to
Action Sports Rentals

SCHEDULE OF EVENTS CONTINUED

MONDAY, NOVEMBER 7, 2016

7:00am – 5:00pm	WSA Registration Open – Atrium
7:00am – 8:00am	Continental Breakfast, ePoster Viewing – Commodore E
7:00am – 12:30pm	Exhibits Viewing – Commodore E
8:00am – 10:00am	Spouse Guest Hospitality & Breakfast – Sunset Terrace
8:00am – 10:20am	Scientific Session III – Commodore C/D
10:20am – 10:30am	Morning Break, Exhibits & ePoster Viewing – Commodore E
10:30am – 12:30pm	Scientific Session IV – Commodore C/D
11:00am – 12:30pm	WSA Spouse Activity: Loews Coronado Bay Resort Spice Rub Cooking Class – Bay Terrace
12:30pm – 1:30pm	WSA Video Session – Commodore C/D
12:30pm – 1:15pm	Women in Surgery Luncheon – Marina Room
1:30pm – 2:30pm	“Measuring Surgical Performance” – Commodore C/D Clifford Ko, MD, <i>American College of Surgeons</i>
2:30pm – 3:30pm	“Purpose, Leadership, and the Team” – Commodore C/D Rear Admiral Edward G. Winters, III, <i>United States Navy</i>
3:30pm – 3:45pm	Afternoon Break
3:45pm – 4:15pm	Quick Shot Presentations – Commodore C/D
4:15pm – 5:15pm	WSA Annual Business Meeting (Members Only) – Commodore C/D
7:00pm – 8:00pm	WSA President’s Reception – Bay Terrace
8:00pm – 11:00pm	WSA President’s Dinner Dance (Black Tie Optional) – Commodore E

SCHEDULE OF EVENTS CONTINUED

TUESDAY, NOVEMBER 8, 2016

<i>7:00am – 11:30am</i>	WSA Registration Open – Atrium
<i>7:00am – 9:00am</i>	Continental Breakfast for Physicians & Spouses/Guests – Atrium
<i>7:30am – 9:20am</i>	Scientific Session V – Commodore C/D
<i>9:20am – 9:50am</i>	WSA Inaugural Nonie Lowry Oration – Commodore C/D “Triple Negative Breast Cancer: Light through the Darkness” Anees B. Chagpar, MD, MSc, MA, MPH, MBA <i>Yale University</i>
<i>9:50am – 11:15am</i>	Scientific Session VI – Commodore C/D
<i>11:15am</i>	Meeting Concludes



Scientific Program

SCIENTIFIC PROGRAM

SUNDAY, NOVEMBER 6, 2016

6:00am – 12Noon

WSA Registration Open

Atrium

6:00am - 12Noon

Exhibits and ePoster Viewing

Commodore E

6:00am - 7:00am

Continental Breakfast for Physicians

Commodore E

8:00am - 10:00am

Spouse/Guest Hospitality & Breakfast

Sunset Terrace

7:00am – 9:10am

Scientific Session I

Moderator: President, R. James Valentine

Commodore C/D

7:00am – 7:15am

Welcome Announcements

7:15am - 7:25am

QS1. CHARACTERIZATION OF THE INFLAMMATORY RESPONSE WITH PERMISSIVE HYPOTENSION DURING TRAUMA RESUSCITATION

Sarah-Ashley E. Ferencz, Ian E. Brown, M. Austin Johnson, Rachel M. Russo, Lucas P. Neff, J. Kevin Grayson, Timothy K. Williams, Joseph M. Galante

University of California, Davis

SCIENTIFIC PROGRAM CONTINUED

SUNDAY, NOVEMBER 6, 2016

7:25am - 7:35am

**QS2. MODIFIABLE DECEASED ORGAN DONOR CRITICAL CARE
PARAMETERS IMPACT DONOR HEART UTILIZATION AND TRANSPLANT
RECIPIENT SURVIVAL: AN ANALYSIS FROM UNOS REGIONS 4, 5, AND 6**

Madhukar S. Patel, Salvador De La Cruz, Jahan Mohebbi, Kiran Khush, Mitchell Sally,
Xiang Gao, Tahnee Groat, *Darren Malinoski*
VA Portland Health Care System

7:35am - 7:45am

QS3. REINTERVENTIONS FOR POSTCAROTID ENDARTERECTOMY STROKE

Sachinder S. Hans, MD
Henry Ford Macomb Hospital

7:45am - 8:05am

**1. GASTROINTESTINAL COMPLICATIONS PREDICT NEAR AND
LONG-TERM MORTALITY AFTER REPAIR FOR AORTO-ENTERIC FISTULA**

Atish Chopra, Lucyna Cieciora, J. Gregory Modrall, *R. James Valentine, Jayer Chung*
University of Texas Southwestern Medical Center
Invited Discussant: *Tina Desai, San Francisco, CA*

8:05am - 8:25am

**2. DEFINING THE IMPACT OF THE CARE DELIVERY MACROENVIRONMENT
(CDM) ON RISK OF READMISSION
AFTER SURGERY**

Sarah A. Brownlee, Matthew A.C. Zapf, John Attisha, Robert H. Blackwell,
Paul C. Kuo, Anai N. Kothari
Loyola University Medical Center
Invited Discussant: Richard Frazee, Temple, TX

8:25am - 8:45am

**3. EMERGENT COLON CANCER RESECTION DOES NOT NEGATIVELY
IMPACT PATIENT OUTCOMES**

Jason W. Smith, Nicholas A. Nash, Russell Farmer, *Charles R. Scoggins,*
J. David Richardson, Kelly M. McMasters
University of Louisville
Invited Discussant: *Stephen Lu, Albuquerque, NM*

SCIENTIFIC PROGRAM CONTINUED

SUNDAY, NOVEMBER 6, 2016

8:45am – 9:00am

Introduction of WSA New Members

Commodore C/D

9:00am – 9:10am

Presentation of 2015 “J. Bradley Aust Award” for Best Paper by a New Member

Recipient: Jason W. Smith

University of Louisville

9:10am – 9:20am

Morning Beverage Break & Exhibits Viewing

Commodore E

9:20am – 10:20am

Scientific Session II

Moderator: 1st Vice President, Thomas H. Cogbill

Commodore C/D

9:20am - 9:40am

4. DIVERTICULITIS DIAGNOSED IN THE EMERGENCY ROOM:

WHAT HAPPENS TO PATIENTS WHO DISCHARGE HOME?

Anne-Marie E. Sirany, Wolfgang B. Gaertner, Elliot G. Arsoniadis, Robert D. Madoff,

Mary R. Kwaan

University of Minnesota

Invited Discussant: *Harry Papaconstantinou, Temple, TX*

9:40am - 10:00am

5. LOCOREGIONAL THERAPIES AND RECURRENT HEPATOCELLULAR CARCINOMA AFTER LIVER TRANSPLANTATION

Min Xu, *Majella Doyle*, Babak Banan, Neeta Vachharajani, Zhengyan Zhang,

Xuanchuan Wang, Jianluo Jia, Deepak K. Nayak, Gundumi A. Upadhyay, Nael Saad,

Katherine Fowler, Elizabeth Brunt, Yiing Lin, *William C. Chapman*

Washington University School of Medicine

Invited Discussant: *Patrick Dean, Rochester, MN*

SCIENTIFIC PROGRAM CONTINUED

SUNDAY, NOVEMBER 6, 2016

10:00am - 10:20am

***6. ENHANCING CONFIDENCE IN GRADUATING GENERAL SURGERY RESIDENTS: ESTABLISHING A CHIEF SURGERY RESIDENT SERVICE AT AN INDEPENDENT ACADEMIC MEDICAL CENTER**

Benjamin T. Jarman, Colette T. O'Heron, Kara J. Kallies, Thomas H. Cogbill
Gundersen Health System

Invited Discussant: *Anton Bilchik, Santa Monica, CA*

10:20am – 11:20am

WSA Presidential Address: “The Hidden Cost of Medicine”

R. James Valentine
Vanderbilt University School of Medicine

12Noon (shotgun start)

WSA Annual Golf Tournament

Coronado Municipal Golf Course

1:00pm – 3:00pm

WSA Guided Wildlife Kayak Tour

Departs from Excursion/Marina Dock adjacent to Action Sports Rentals

SCIENTIFIC PROGRAM CONTINUED

MONDAY, NOVEMBER 7, 2016

7:00am – 5:00pm

WSA Registration Open

Atrium

7:00am – 12:30

Exhibits and ePoster Viewing

7:00am – 8:00am

Continental Breakfast, Exhibits Viewing

Commodore E

7:00am – 8:00am

ePoster Presentations

Moderators: Anton J. Bilchik, Anees B. Chagpar,

Carmen Solorzano, Peter Rhee

Commodore E

8:00am – 10:00am

Spouse/Guest Hospitality

Sunset Terrace

8:00am – 10:20am

Scientific Session III

Moderator: President, R. James Valentine

Commodore C/D

8:00am – 8:20am

7. THE IMPACT OF CAUDATE LOBE RESECTION ON MARGIN STATUS AND OUTCOMES IN PATIENTS WITH HILAR CHOLANGIOCARCINOMA: A MULTI-INSTITUTION ANALYSIS FROM THE U.S. EXTRAHEPATIC BILIARY MALIGNANCY CONSORTIUM

Neal Bhutiani, *Charles R. Scoggins*, *Kelly M. McMasters*, Celia G. Ethun,

George A. Poultsides, Timothy M. Pawlik, Sharon M. Weber, Carl R. Schmidt,

Ryan C. Fields, *Kamran Idrees*, Ioannis Hatzaras, Perry Shen, Shishir K. Maithel,

Robert C.G. Martin

University of Louisville

Invited Discussant: *Christopher Anderson, Jackson, MI*

SCIENTIFIC PROGRAM CONTINUED

MONDAY, NOVEMBER 7, 2016

8:20am - 8:40am

8. PERCUTANEOUS GASTROSTOMY IN NECROTIZING PANCREATITIS: FRIEND OR FOE?

Alexandra M. Roch, Rose A. Carr, James L. Watkins, Glen Lehman, Michael G. House, Attila Nakeeb, *C. Max Schmidt, Eugene P. Ceppa*, Nicholas J. Zyromski
Indiana University School of Medicine

Invited Discussant: *Barish Edil, Aurora, CO*

8:40am - 9:00am

***9. PEDIATRIC-PROTOCOL MULTIMODAL THERAPY IMPROVES SURVIVAL IN AYAS AND OLDER ADULTS WITH RHABDOMYOSARCOMA**

Trevan D. Fischer, Shrawan G. Gaitonde, Bradley C. Bandera, Mehul V. Raval, Sanjeev A. Vasudevan, Kenneth W. Gow, Elizatheth A. Beierle, John J. Doski, Adam B. Goldin, Monica Langer, Jed G. Nuchtern, Leland J. Foshag, *Melanie Goldfarb*
John Wayne Cancer Institute

Invited Discussant: *Thomas A. Aloia, Houston, TX*

9:00am - 9:20am

***10. THE ONSET OF COAGULATION FUNCTION RECOVERY IS DELAYED IN SEVERELY INJURED TRAUMA PATIENTS WITH VENOUS THROMBOEMBOLISM**

Belinda H. McCully, Christopher R. Connelly, Kelly A. Fair, John B. Holcomb, Erin E. Fox, Eileen M. Bulger, *Martin A. Schreiber*
Oregon Health and Science University

Invited Discussant: *Kenji Inaba, Los Angeles, CA*

9:20am - 9:40am

11. BOWEL OBSTRUCTION IN ADVANCED CANCER PATIENTS: VARIABLES ASSOCIATED WITH OUTCOME AND SURVIVAL

Brian B. Badgwell, Deep K. Pujara, Yi J. Chiang, Janice C. Cormier
University of Texas MD Anderson Cancer Center

Invited Discussant: *Eugene Choi, Houston, TX*

SCIENTIFIC PROGRAM CONTINUED

MONDAY, NOVEMBER 7, 2016

9:40am - 10:00am

12. ADVERSE EFFECT OF POSTDISCHARGE CARE FRAGMENTATION ON OUTCOMES FOLLOWING READMISSIONS AFTER SURGERY

Anai N. Kothari, Yoshiki Ezure, Veronica M. Loy, Sarah A. Brownlee, Colleen Schaidle-Blackburn, Scott J. Cotler, Diego M. di Sabato, *Paul C. Kuo*, Amy D. Lu
Loyola University Medical Center

Invited Discussant: *William C. Chapman, St. Louis, MO*

10:00am - 10:20am

13. LYMPH NODE POSITIVITY IN APPENDICEAL ADENOCARCINOMA: SHOULD SIZE MATTER?

John V. Gahagan, Matthew Whealon, Michael J. Phelan, Steven Mills, Alessio Pigazzi, Michael J. Stamos, *Ninh T. Nguyen*, Joseph C. Carmichael
University of California, Irvine

Invited Discussant: *Scott Kelley, Rochester, MN*

10:20am – 10:30am

Morning Break, Exhibits & ePoster Viewing

Commodore E

10:30am – 12:10pm

Scientific Session IV

Moderator: 2nd Vice President, Vijay K. Maker

Commodore C/D

10:30am - 10:50am

***14. QUALITY OF LIFE AND TOXICITY OUTCOMES AFTER INTRAOPERATIVE RADIATION THERAPY FOR EARLY STAGE BREAST CANCER TREATED: A PROSPECTIVE STUDY.**

Surupa Sen Gupta, Corinne Costellic, Aise Gulla, Elizabeth Hechenbleikner, Brian Collins, Sonali Rudra, Shawna Willey, Bridget Oppong, Russell C. Langan, Sulakshana Seevaratnam, *Eleni Tousimis*
MedStar Georgetown University Hospital

Invited Discussant: *Anees B. Chagpar, New Haven, CT*

SCIENTIFIC PROGRAM CONTINUED

MONDAY, NOVEMBER 7, 2016

10:50am - 11:10am

**15. BETHESDA CATEGORY III, IV THYROID NODULES:
CAN NODULE SIZE HELP PREDICT MALIGNANCY?**

Colleen M. Kiernan, MD MPH, *Carmen C. Solorzano MD*
Vanderbilt University School of Medicine

Invited Discussant: *Melanie Goldfarb, Santa Monica, CA*

11:10am - 11:30am

**16. BULLYING, ASSAULT AND ABUSE: INJURY PATTERNS IN
CHILDREN ADMITTED TO TRAUMA CENTERS**

Galinos Barmparas, Navpreet K. Dhillon, *Eric J. Ley*, Rodrigo F. Alban, Rex Chung,
Matthew Bloom, Nicolas Melo, *Daniel R. Margulies*
Cedars Sinai Medical Center

Invited Discussant: *Ali Salim, Boston, MA*

11:30am - 11:50am

***17. IMPACT OF LAPAROSCOPIC BARIATRIC SURGERY ON N-TERMINAL PRO
B-TYPE NATRIURETIC PEPTIDE: A COMPARISON OF ROUX-EN-Y GASTRIC
BYPASS, SLEEVE GASTRECTOMY, AND ADJUSTABLE GASTRIC BANDING**

Lindsey Voller, Chase Palisch, Daniel T. Rogan, Sayantan Deb, Kaci Dudley,
Homero Rivas, *John M. Morton*
Stanford School of Medicine

Invited Discussant: *Erica Sutton, Louisville, KY*

11:50am - 12:10pm

**18. GENDER-SPECIFIC DIFFERENCES IN COLON CANCER WHEN QUALITY
MEASURES ARE ADHERED TO: RESULTS FROM INTERNATIONAL,
PROSPECTIVE, MULTICENTER CLINICAL TRIALS**

Shrawan G. Gaitonde, Aviram Nissan, Mladjan Protic, Alex Stojadinovic, Zev Wainberg,
David C. Chen, *Anton J Bilchik*
John Wayne Cancer Institute

Invited Discussant: *Steven Stain, Albany, NY*

SCIENTIFIC PROGRAM CONTINUED

MONDAY, NOVEMBER 7, 2016

12:30pm – 1:25pm

WSA Video Session & Lunch Break

Moderator: Program Chair, Charles R. Scoggins
Commodore C/D

V1. LAPAROSCOPIC CHOLECYSTECTOMY

Apram Jyot
Mayo Clinic

V2. LAPAROSCOPIC REPAIR OF GIANT TYPE IV HIATAL HERNIA WITH INTRATHORACIC UPSIDE DOWN STOMACH, HERNIATED OMENTUM, SMALL BOWEL AND COLON, AND CHALLENGES WITH MANAGEMENT OF POSTOPERATIVE BILATERAL PLEURAL SPACES

Matthew Weaver, Farzaneh Banki
McGovern Medical School at UT Health

V3. FOUR-QUADRANT, SINGLE DOCK ROBOTIC TOTAL PROCTOCOLECTOMY

Russ Farmer
University of Louisville

V4. LAPAROSCOPIC NON-MESH ALTERNATIVE FOR INGUINAL HERNIA REPAIR

Shirin Towfigh, Yasmine Shafik
Beverly Hills Hernia Center

V5. ROBOT ASSISTED, LAPAROSCOPIC LIVER SPARING TECHNIQUE FOR RESECTION OF SEGMENT 6/7 COLORECTAL LIVER METASTASES

Charles R. St. Hill
University of Nevada School of Medicine

12:30pm – 1:15pm

Women in Surgery Luncheon

Marina Room

SCIENTIFIC PROGRAM CONTINUED

MONDAY, NOVEMBER 7, 2016

1:30pm – 2:30pm

“Measuring Surgical Performance”

Clifford Ko, MD

American College of Surgeons

Commodore C/D

2:30pm – 3:30pm

“Purpose, Leadership, and the Team”

Rear Admiral Edward G. Winters, III

United States Navy

Commodore C/D

3:30pm – 3:45pm

Afternoon Break

3:45pm – 4:15pm

Quick Shot Presentations

Moderator: 2nd Vice President, Vijay K. Maker

Commodore C/D

3:45pm - 3:55pm

QS4. LAPAROSCOPIC REDO ANTIREFLUX SURGERY IS MORE COST EFFECTIVE THAN OPEN REPAIR

Farzaneh Banki, Matthew Weaver, David Roife, Anshu Khanna, Kelly Ochoa

McGovern Medical School at UT Health

3:55pm - 4:05pm

QS5. IS THERE A “SMOKERS PARADOX” AMONG PATIENTS WITH CHEST TRAUMA?

Olubode A. Olufajo, Israel T. Agaku, Katherine Armstrong, Arturo J. Rios Diaz,

Joaquim M. Havens, Zara Cooper, Adil H. Haider, *Ali Salim*

Brigham and Women’s Hospital

SCIENTIFIC PROGRAM CONTINUED

MONDAY, NOVEMBER 7, 2016

4:05pm - 4:15pm

QS6. BILIARY TRACT CANCER XENOGRAPHS: SURGEON IMPACT ON INDIVIDUALIZED MEDICINE

John R. Bergquist, Tommy Ivanics, Rondell P. Graham, Michael S. Torbenson, Stephen J. Murphy, George Vasmatazis, Lewis R. Roberts, Gregory J. Gores, *Michael L. Kendrick, Michael B. Farnell*, Rory L. Smoot, *David M. Nagorney*, Mark J. Truty
Mayo Clinic, Rochester

4:15pm – 5:15pm

WSA Annual Business Meeting (Members Only)

Commodore C/D

7:00pm – 8:00pm

WSA President's Reception

Bay Terrace

8:00pm – 11:00pm

WSA President's Dinner Dance (Black Tie Optional)

Commodore E

SCIENTIFIC PROGRAM CONTINUED

TUESDAY, NOVEMBER 8, 2016

7:00am – 11:30am

WSA Registration Open

Atrium

7:00am – 9:00am

Continental Breakfast for Physicians & Spouses/Guests

Atrium

7:30am – 9:20am

Scientific Session V

Moderator: President Elect (TBD)

Commodore C/D

7:40am - 8:00am

19. PANCREATIC CYST FLUID VASCULAR ENDOTHELIAL GROWTH FACTOR: HIGHLY ACCURATE IN COMBINATION WITH CARCINOEMBRYONIC ANTIGEN FOR SEROUS CYSTIC NEOPLASM DIAGNOSIS

Rosalie A. Carr, Michele T. Yip-Schneider, Scott C. Dolejs, *C. Max Schmidt*

Indiana University Department of General Surgery

Invited Discussant: *Bryan Clary, San Diego, CA*

8:00am - 8:20am

20. LIVER TRANSPLANTATION FOR PRIMARY PEDIATRIC HEPATIC TUMORS

Adeel S Khan, Brittany Brecklin, Vijay Subramanian, Neeta Vachharajani,

Michelle Nadler, *Jeffery A Lowell, William C. Chapman, M B Majella Doyle*

Washington School of Medicine

Invited Discussant: *Erin Maynard, Portland, OR*

SCIENTIFIC PROGRAM CONTINUED

TUESDAY, NOVEMBER 8, 2016

8:20am - 8:40am

21. RURAL GENERAL SURGERY: A 38-YEAR EXPERIENCE WITH A REGIONAL NETWORK ESTABLISHED BY AN INTEGRATED HEALTH SYSTEM IN THE MIDWESTERN UNITED STATES

Thomas H. Cogbill MD, Marilu Bintz MD

Gundersen Health System

Invited Discussant: *David Borgstrom, Morgantown, WV*

8:40am - 9:00am

22. A TALE OF TWO CANCERS: TRAVELING TO TREAT PANCREATIC AND THYROID CANCER

Michael G. White, Megan K. Applewhite, *Peter Angelos, Edwin L. Kaplan, Dhezheng Huo, Raymon H. Grogan*

The University of Chicago

Invited Discussant: *Todd Beyer, Albany, NY*

9:00am - 9:20am

23. THE VISCOELASTIC FIBRINOLYSIS CHALLENGE: SINGLE LABORATORY ASSAY TO PREDICT MASSIVE TRANSFUSION WITHIN 15 MINUTES

Hunter B. Moore, *Ernest E. Moore*, Michael P. Chapman, Benjamin R. Huebner, Peter M. Einersen, Solimon Oushy, Christopher C. Silliman, Anirban Banerjee, Angela Sauaia

Denver Health Medical Center

Invited Discussant: *Peter Rhee, Atlanta, GA*

9:20am - 9:50am

WSA Inaugural Nonie Lowry Oration

“Triple Negative Breast Cancer: Light through the Darkness”

Anees B. Chagpar, MD, MSc, MA, MPH, MBA

Yale University

Commodore C/D

SCIENTIFIC PROGRAM CONTINUED

TUESDAY, NOVEMBER 8, 2016

9:50am – 11:15am

Scientific Session VI

Moderator: President Elect (TBD)

Commodore C/D

9:50am - 10:10am

24. FACTORS ASSOCIATED WITH NON-HOME DISCHARGE FOLLOWING ARTERIAL BYPASS GRAFTING FOR CRITICAL LIMB ISCHEMIA

Sachinder S. Hans, Marika Y. Gassner, Graham W. Long, Mitchell R. Weaver, Yeo J. Park, Hitinder S. Gurm, P. Michael Grossman, Peter Henke
Henry Ford Hospital

Invited Discussant: *Carlos Timaran, Dallas, TX*

10:10am - 10:30am

25. LAPAROSCOPIC REPAIR OF RECURRENT INGUINAL HERNIAS OFFERS SIMILAR OUTCOMES AND QUALITY OF LIFE TO PRIMARY LAPAROSCOPIC REPAIR

Stephen P Haggerty, Tyler B Hall, Brittany Lapin, Lava Patel, Branden Johnson, John Linn, Woody Denham, *Michael B Ujiki*
NorthShore University HealthSystem

Invited Discussant: *Jonathan Myers, Chicago, IL*

10:30am - 10:50am

26. PREGNANCY ASSOCIATED MELANOMA IS NOT ASSOCIATED WITH ADVERSE OUTCOMES

Maris S. Jones, Jihey Lee, Stacey L. Stern, *Mark B. Faries*
John Wayne Cancer Institute

Invited Discussant: *Charles R. Scoggins, Louisville, KY*

SCIENTIFIC PROGRAM CONTINUED

TUESDAY, NOVEMBER 8, 2016

10:50am - 11:10am

27. OPERATING ROOM FIRES AND SURGICAL SKIN PREPS

Edward L Jones, Douglas M Overbey, Brandon C Chapman, Todd R Arcomano,
Teresa S Jones, John T Moore, *Thomas N Robinson*

Denver Veterans Affairs Medical Center

Invited Discussant: John Russell, Albuquerque, NM

11:15

Closing Remarks, Meeting Concludes

PAST RECIPIENTS OF THE "J. BRADLEY AUST AWARD"

FOR BEST PAPER BY A NEW MEMBER

2015

Jason W. Smith
Louisville, Kentucky

2014

Brian Badgwell
Houston, Texas

2013

James W. Jakub
Rochester, Minnesota

2012

Thomas A. Aloia
Houston, Texas

2011

M.B. Majella Doyle
St. Louis, Missouri

2010

Thomas Robinson
Aurora, Colorado

2009

Karen Borman
Abington, Pennsylvania

2008

Mark B. Faries
Santa Monica, California

2007

Jason B. Fleming
Houston, Texas

2006

Frank R. Arko
Dallas, Texas

2005

Donald E. Low
Seattle, Washington

2004

Samuel K. Snyder
Temple, Texas

2003

Nora Hansen
Santa Monica, California

2002

Mark S. Talamonti
Chicago, Illinois

2001

Kelly M. McMasters
Louisville, Kentucky

2000

M. Ashraf Mansour
Maywood, Illinois

1999

William C. Chapman
Nashville, Tennessee

1998

R. Stephen Smith
Ranoke, Virginia

Presenting author must be a new WSA member within the past 2 years in order to qualify for the J. Bradley Aust Award.



Oral Abstracts

Individual abstracts of the papers to be presented at this year's annual meeting appear on the following pages:

ORAL ABSTRACTS

1. GASTROINTESTINAL COMPLICATIONS PREDICT NEAR AND LONG-TERM MORTALITY AFTER REPAIR FOR AORTO-ENTERIC FISTULA

Atish Chopra, Lucyna Cieciora, J. Gregory Modrall, R. James Valentine, Jayar Chung
University of Texas Southwestern Medical Center

Background: Aorto-enteric fistulae (AEF) represent a subset of aortic graft infections that are particularly morbid and lethal. Data regarding the optimal management of AEF remain unclear due to the low frequency and limited follow up in the literature. We therefore aimed to identify predictors of morbidity and mortality after AEF repair.

Methods: We performed a single-center retrospective review of consecutive AEF reconstructions. Demographics, co-morbidities, intra- and post-operative variables were obtained. Descriptive statistics of the median and interquartile range (IQR) and frequencies and percentages were utilized where appropriate. Chi-squared, Kruskal-Wallis, and Cox proportional-hazards modeling were utilized to quantify outcomes stratified by baseline variables.

Results: Between June 1995-March 2014, 49 consecutive patients (male 29; 59%) presented with AEF, with an overall median age of 69 (IQR 61, 75) years. The most frequent co-morbidities were hypertension (39, 80%), hyperlipidemia (38, 78%), and peripheral arterial disease (33, 67%). 26 (53%) patients presented with AEF after prior aorto-femoral bypass, 10 (20%) after prior tube graft, 6 (12%) after prior endovascular repair and 5 (10%) after prior aorto-infrainguinal bypass. Median follow-up for the entire cohort was 150 (IQR 26, 570) months. 34 (69%) underwent aortic reconstruction with femoral vein, 3 (6%) were repaired with rifampin-soaked Dacron graft. 12 (24%) subjects underwent extra-anatomic bypass and aortic ligation. The duodenum was the most common location of the enteric defect (39, 80%), followed by the jejunum (8, 16%), colon (1, 2%), and esophagus (1, 2%). Duodenal leak or re-infection complicated 5 (10%) of the primary enteric repairs but none of the complex enteric repairs performed with resection and/or bypass. 12 patients (49%) died by 60 days. The presence of advanced age, coronary artery disease, chronic renal insufficiency, urgent or emergent operative intervention, gastrointestinal complications (12, 24%), and pulmonary insufficiency/pneumonia (4, 8%) were all associated with an increase in overall mortality on univariate analysis ($p < 0.05$). Cox proportional-hazards regression models were used to estimate AEF-mortality association with specific causes of overall and 60-day mortality. Gastrointestinal complication was the only independent predictor of overall (relative risk [RR], 3.99; 95% CI, 1.55 to 10.26; $p = 0.004$) and 60-day (RR, 4.67; 95% CI, 1.26 to 17.23; $p = 0.02$) mortality.

Conclusion: Our series represents the largest series of AEF repairs with long-term follow up showing that approximately 50% of AEF repairs die within the first two months of surgery. Gastrointestinal complications increase the risk of mortality by 4-5-fold.

Methods to decrease gastrointestinal may prove most impactful at improving mortality rates for this lethal pathology.

2. DEFINING THE IMPACT OF THE CARE DELIVERY MACROENVIRONMENT (CDM) ON RISK OF READMISSION AFTER SURGERY

Sarah A. Brownlee, Matthew A.C. Zapf, John Attisha, Robert H. Blackwell, Paul C. Kuo, Anai N. Kothari

Loyola University Medical Center

Background: Complex interactions between patient characteristics and imposed hospital attributes define the care delivery macroenvironment (CDM). While previous work has focused on patient factors, other aspects of the CDM -including hospital factors like staffing ratios and rehabilitation services -may play an equal or even greater role in determining surgical outcomes. The objective of this study was to determine the relative contribution of various aspects of the CDM to one-year readmission risk after surgery.

Methods: The American Hospital Association (AHA) Annual Survey and Healthcare Cost and Utilization Project State Inpatient Databases (HCUP SID) from Florida, Washington, and New York were linked for analysis. Patients undergoing AAA repair, pancreatectomy, colectomy, CABG, and THR between 2009 and 2013 were included. Readmission risk was assessed using smoothed hazard estimates for all cause readmission in the year after surgery. The relative impact of hospital vs. patient characteristics on the heterogeneity of readmission risk between hospitals was determined using multi-level survival models with shared frailty.

Results: 502,157 patients at 347 hospitals met our inclusion criteria. One-year readmission rate was 23.5% (12.4-35.6% across procedures). After controlling for procedure, variation in readmission risk was 7.9% ($\pm 0.7\%$) between hospitals. Hospital volume accounted for 2.8% of the variance, staffing for 9.8%, perioperative resources for 2.9%, and structural characteristics for 7.5%. Patient clinical characteristics accounted for 2.6% of the variance and zip code for 3.8% of the variance. A total of 70.6% of the variation in readmission risk across hospitals was not accounted for in the measured covariates. A reduction of 10% in the variation across hospitals of known covariates would project to 12,379 fewer annual postoperative readmissions. Components of the CDM that decreased 1-year readmission risk included: high physician-to-bed ratio (HR 0.85, $p < 0.001$), transplant center (HR 0.87, $p = 0.022$), high income zip code (HR 0.89, $p < 0.001$), high nurse-to-bed ratio (HR 0.90, $p = 0.047$), and cancer center designation (0.93, $p = 0.021$).

Conclusion: Variation in readmission risk across hospitals is more attributable to hospital factors than to patient characteristics. Modification of the CDM to reduce this variation could have significant impact on post-discharge surgical care. Addressing hospital staffing and structure may lead to more significant reductions in readmission risk than focusing on clinical patient characteristics alone.

3. EMERGENT COLON CANCER RESECTION DOES NOT NEGATIVELY IMPACT PATIENT OUTCOMES

Jason W. Smith, Nicholas A. Nash, Russell Farmer, Charles R. Scoggins,
J. David Richardson, Kelly, M McMasters
University of Louisville

Background: Emergency treatment of colon cancer has traditionally been linked with dismal outcomes leaving unclear how aggressive emergency surgical procedures should be in this setting. We aimed to define short- and long-term outcomes in this diverse group of patients provide updated data for surgical decision making.

Methods: A case matched retrospective evaluation of all elective and emergent colectomies for colon cancer performed at our institution from 2011-2015. Patients were matched based on oncologic stage at time of presentation to OR. Demographic, physiologic, operative, and outcomes data were collected following IRB approval. Univariate and multivariate analysis was performed with a priori significance at $p \leq 0.05$.

Results: A total of 548 patients were included in the review, 431 in the elective group and 117 in the emergency group. There were no differences between groups in terms of age, gender, diagnosis, BMI, or comorbid conditions. Patients presenting with perforation had much higher complication and mortality rates compared to all other patients, were less likely to receive an R0 resection, and had fewer lymph nodes sampled compared to elective resection. Excluding perforation, TMN matched case cohorts ($n=82/\text{group}$) demonstrated no differences in R0 resection or estimated blood loss (EBL) at initial operation. There was no difference in number of mesenteric lymph nodes removed between emergency and elective patients (12 ± 5 vs. 14 ± 8 , respectively; $p=0.06$). There were no significant differences in anastomotic leak rate (6% vs 4%, $p=0.44$) or SSI rate (8% vs 5%: $P=0.36$) between the emergency and elective cohorts.

Emergency cases had a higher ostomy formation rate compared to the elective group, and had a longer length of hospital stay. Median follow-up was 31 months. One-year follow-up was similar between the groups (both $>93\%$) and there was no difference in clinical trial enrollment between the emergency and elective cohorts. Treatment with adjuvant chemotherapy (83% vs 88%, $p=0.89$) and time to initiation of adjuvant chemotherapy (5.8 ± 1.7 weeks vs 6.3 ± 1.9 weeks; $p=0.07$) was not different between the elective and emergency cohorts. In a risk-adjusted Cox regression analysis, emergency operation was not associated with worse overall (HR = 1.16, 95% CI 0.88- 1.58; $P=0.609$) or disease-free survival (HR = 1.06, 95% CI 0.71-1.47; $P=0.817$) compared to elective operation. Advanced age, higher ASA class, presence of residual disease, and advanced stage-- but not emergency presentation--were independent predictors of worse overall survival.

Conclusion: Excluding patients that present with perforation, emergent resection of colon cancers does not appear to adversely affect operative outcomes or patient survival. Patients treated in an emergent setting are just as likely to receive follow-up care and be enrolled in clinical trials as those treated in an elective setting thus standard oncologic principles should be applied to their management.

4. DIVERTICULITIS DIAGNOSED IN THE EMERGENCY ROOM: WHAT HAPPENS TO PATIENTS WHO DISCHARGE HOME?

Anne-Marie E. Sirany, Wolfgang B. Gaertner, Elliot G. Arsoniadis, Robert D. Madoff,
Mary R. Kwaan

University of Minnesota

Background: Inpatient treatment of patients with diverticulitis represents a significant financial and clinical burden to the healthcare system and to patients themselves. The aim of this study was to evaluate and compare the outcomes of patients diagnosed with and treated for diverticulitis in the emergency department (ED) who were discharged to home versus admitted to the hospital.

Methods: We reviewed all patients evaluated in the emergency room of a metropolitan health system (4 hospitals with 1 academic medical center) with the primary diagnosis of diverticulitis (ICD9 562.11) from 9/2010-1/2012. Patients without an abdominopelvic CT diagnosis diverticulitis or without any follow up between the index encounter were excluded.

Results: We identified 240 patients; 108 (45%) men, 69 (30%) with a reported history of diverticulitis, 19 (27%) of whom were previously hospitalized for diverticulitis. The mean patient age was 59.1 years (SD 16.1), 22% had Charlson >2, and 7.5% were on steroids or immunosuppressant medication. CT characteristics included extraluminal air (21%), pericolic or pelvic abscess (12%), free fluid (16%), and pneumoperitoneum (6%). The majority of patients had sigmoid and/or descending colon involvement (95%). Of the 240 patients, 149 (62%) were admitted to the hospital and 91 (38%) were discharged to home on oral antibiotics. Median follow-up for all patients was 36.5 months (IQR 25.2-43). Patients discharged to home were less likely to be over 65 years (24% versus 43%; $p=0.003$), on steroids or immunosuppressant medication ($p=0.02$), show extraluminal air (6% versus 30%; $p<0.0001$) or abscess (1% versus 19%; $p<0.0001$) on CT scan. Patients who were discharged home from the ER had a lower Charlson score than those who were admitted (Wilcoxon sign rank test $z=-2.79$; $p=0.005$). No significant differences were seen in gender, history of diverticulitis, or white blood cell count >10,000 on presentation. Among the admitted patients, 21% underwent surgery during the admission; 1/3 were emergencies. Among patients discharged from the ED, a small number returned to the ED or were readmitted within 30 days (13%), with only one patient (1%) requiring emergency surgery, but not until 20 months later. In long-term follow up, patients discharged from the ED were slightly less likely to develop a CT- proven recurrence of diverticulitis (23% versus 28%) and undergo colon resection at a subsequent encounter compared to admitted patients (16% versus 20%).

Conclusion: Patients who are diagnosed with diverticulitis in the ED and subsequently discharged to home are no more likely to require readmission or emergency surgery than those patients who are admitted to the hospital. This appears to be a safe approach for selected patients, particularly if CT findings are included in the decision- making process.

5. LOCOREGIONAL THERAPIES AND RECURRENT HEPATOCELLULAR CARCINOMA AFTER LIVER TRANSPLANTATION

Min Xu, Majella Doyle, Babak Banan, Neeta Vachharajani, Zhengyan Zhang, Xuanchuan Wang, Jianluo Jia, Deepak K. Nayak, Gundumi A. Upadhyaya, Nael Saad, Katherine Fowler, Elizabeth Brunt, Yiing Lin, William C. Chapman
Washington University School of Medicine

Background: Neoadjuvant locoregional therapies (LRT) have been widely used to reduce tumor burden or downstage hepatocellular carcinoma (HCC) prior to orthotopic liver transplantation (OLT). LRT is effective at causing tumor necrosis, but the treatment response may result in the release of vascular endothelial growth factors (VEGFs) that promote tumor progression. In other cancers such as breast and colon, studies have associated VEGFC-induced lymphangiogenesis with the lymphatic spread of tumor cells and reduced survival. Anecdotally, we had observed an increase in the lymphatic pattern of tumor recurrence with the use of LRT prior to OLT. We therefore hypothesize that LRT-induced tumor necrosis causes the release of VEGF to stimulate lymphangiogenesis and increase the incidence of lymphatic metastasis.

Methods: We performed a retrospective study of 384 HCC patients treated by OLT at our institution. Response to neoadjuvant LRT was assessed by histologic examination of the tumors in the explanted liver after OLT. The patients were followed for an average of 5 years after OLT. To examine plasma VEGFA and VEGFC levels after LRT, ELISA assays were performed on blood samples from a consecutive cohort of 171 HCC patients. Formalin-fixed and paraffin-embedded HCC blocks were obtained from 43 patients to examine the density of peritumor vascular and lymphatic vessels using immunofluorescence staining with anti-CD31 and anti-lymphatic vessel endothelial hyaluronan receptor-1 antibodies. The expression of VEGFR-2 and VEGFR-3 in the tumor tissues were quantified using Western blot analysis.

Results: Of the 384 HCC patients, 268 underwent neoadjuvant LRT. Patients with non-necrosis (n=58, 5.2% recurrence) and complete tumor necrosis (n=70, 6.1% recurrence) had significantly lower 5-year recurrence rates than those with partial necrosis (n=140, 22.6% recurrence, $p<0.001$). With histologic assessment of peritumor lymphatic duct densities, lymphatic ducts were visualized around partially-necrotic tumors, but not around tumors with non-necrosis. The plasma levels of VEGFA and VEGFC were significantly elevated in patients with evidence of tumor necrosis (n=102) as compared to those without necrosis (n=69; $p<0.001$). By Western blot analysis, VEGFR-2 and VEGFR-3 expression in the peritumor tissue associated with partially necrotic tumors were significantly higher than that of non-necrosis tumors (n=3 per group, $p<0.020$ and 0.006 , respectively).

Conclusion: Partial tumor necrosis induced by LRT was associated with an increased risk of lymphatic metastasis post-OLT as compared to tumors with non-necrosis or complete necrosis. This clinical outcome with partial tumor necrosis is associated with increased VEGF levels in the blood, VEGFR expression in tumor tissues, and lymphangiogenesis around the tumors. These results provide a rationale for the use of anti-lymphangiogenic agents with neoadjuvant LRT to decrease the pattern of lymphatic metastasis after OLT.

6. ENHANCING CONFIDENCE IN GRADUATING GENERAL SURGERY RESIDENTS: ESTABLISHING A CHIEF SURGERY RESIDENT SERVICE AT AN INDEPENDENT ACADEMIC MEDICAL CENTER

Benjamin T. Jarman MD, Colette T. O'Heron, Kara J. Kallies MS,
Thomas H. Cogbill MD
Gundersen Health System

Background: Providing opportunities for autonomy to bolster the development of independence and confidence during surgery residency remains among the most pronounced challenges of the current training paradigm. Prior to 2011, graduates of our surgery residency noted a lack of perceived autonomy. We sought to implement a system to provide chief residents with increased autonomy and full spectrum continuity of patient care.

Methods: A Chief Resident Service (CRS) was initiated in January 2011. The CRS was designed as an independent service with call responsibilities, office hours, operative scheduling, procedural coding and endoscopy time. Faculty was assigned to supervise and evaluate each aspect of patient care consistent with institutional and national guidelines. Each chief was assigned to the service for an equal amount of time based on the number of chiefs in a given year. Operative logs from graduates who participated in the CRS from January 2011 through June 2014 and their first year in practice were reviewed. Laparoscopic cholecystectomies, ileocelectomies, ventral/incisional hernia repairs, inguinal hernia repairs, and endoscopies were selected for comparison. Graduates were surveyed to assess satisfaction with their CRS experience. Patient and program evaluations were reviewed. Challenges including teaching faculty engagement and establishing resident ownership for all aspects of patient care were addressed throughout the experience.

Results: Nine chief residents successfully completed CRS and submitted case logs. Three graduates completed a fellowship; their first year post-fellowship cases were evaluated. The first 3 residents to graduate after CRS implementation spent a mean of 59.7 ± 2.1 days on CRS and subsequent graduates spent a mean of 174.8 ± 10.6 days on CRS. Median total case volume was 1,101 (994-1,311) during the 5 year residency, 92 (20-149) during CRS and 299 (99-784) during the first year in practice. The median case volumes for selected procedures for the entire 5-year residency, CRS and first year of practice were as follows: 146 (120-157), 24 (3-32), and 34 (15-112) laparoscopic cholecystectomies; 81 (51-94), 1 (1-4), and 3 (0-8) ileocelectomies; 57 (35-86), 4 (0-9), and 8 (2-34) ventral/incisional hernia repairs; 102 (87-137), 12 (3-16), and 13 (3-86) inguinal hernia repairs. Median upper endoscopy volume over the 5 year residency, CRS, and first year in practice was 67 (41-78), 5 (0-22), and 17 (4-86); lower endoscopy volume was 172 (120-255), 10 (0-42), and 71 (13-156), respectively. All nine graduates returned completed surveys, with "very similar case mixes" reported by 44% of graduates, and "somewhat similar case mix" reported by 56% of graduates. Results were similar for graduates who entered general surgery practice directly after residency or pursued a fellowship. All nine graduates reported that they were very satisfied with their CRS experience and that it was very beneficial to their current practice. Patient evaluations pertaining to the chief resident's care were uniformly positive. Annual program reviews by faculty and residents demonstrated that the CRS was a major strength of our residency.

Conclusion: Creation of a CRS to increase resident autonomy and provide continuity of patient care with appropriate faculty supervision has been successful. Case mix and volumes were consistent with our surgical graduates' experience and provided a medium for operative and clinical assessment during surgery residency.

7. THE IMPACT OF CAUDATE LOBE RESECTION ON MARGIN STATUS AND OUTCOMES IN PATIENTS WITH HILAR CHOLANGIOCARCINOMA: A MULTI-INSTITUTION ANALYSIS FROM THE U.S. EXTRAHEPATIC BILIARY MALIGNANCY CONSORTIUM

Neal Bhutiani, Charles R. Scoggins, Kelly M. McMasters, Celia G. Ethun, George A. Poultsides, Timothy M. Pawlik, Sharon M. Weber, Carl R. Schmidt, Ryan C. Fields, Kamran Idrees, Ioannis Hatzaras, Perry Shen, Shishir K. Maithel, Robert C.G. Martin
University of Louisville

Background: The objective of this study was to determine the impact of caudate resection for hilar cholangiocarcinoma on margin status and outcomes.

Methods: A multi-institutional database of 1092 patients treated for extrahepatic biliary malignancies at institutions of the U.S. Extrahepatic Biliary Malignancy Consortium was queried for patients undergoing successful resections with curative intent for hilar cholangiocarcinoma. Patients were grouped according to whether or not they underwent caudate resection as part of operative intervention. Groups were compared along demographic, baseline, and tumor characteristics as well as perioperative and outcomes parameters. Subgroup analysis was performed based on AJCC T stage as well as anatomic location of resection (right versus left liver).

Results: A total of 256 patients were identified, with 90 undergoing resection including caudate resection and 166 undergoing resection without caudate resection. Patients undergoing caudate resection were less likely to have a final positive margin ($p=0.01$) or require reoperation ($p=0.005$). Caudate resection was not associated with improved overall (OS) or recurrence free survival (RFS) (22.9 vs. 24.8 months, $p=0.57$; 20.3 vs. 22.0 months, $p=0.61$). However, patients undergoing caudate resection were more likely to have no evidence of disease (NED; $p=0.001$) and less likely to be dead of disease (DOD; $p=0.03$) at last follow-up. On subgroup analysis by tumor stage, patients with Stage 2b and 4 tumors undergoing caudate resection were more likely to have negative final margins ($p=0.03$). Regardless of stage, caudate resection conferred no significant benefit with regards to OS or RFS. Patients with stage 1 and 2b tumors undergoing caudate resection were more likely to have NED ($p=0.04$, $p=0.002$) and patients with stage 2a and 2b tumors undergoing caudate resection were less likely to be DOD at last follow-up ($p=0.009$, $p=0.02$). Finally, on subgroup analysis by anatomic resection, caudate resection along with right sided resection or left sided resection did not impact margin positivity ($p=0.71$, $p=0.11$), OS ($p=0.10$, $p=0.96$), or RFS ($p=0.93$, $p=0.96$). Caudate resection along with right sided resection was, however, associated with a higher likelihood of having NED ($p=0.008$).

Conclusion: Caudate resection is associated with a higher likelihood of margin- negative resection in patients with hilar cholangiocarcinoma. While it does not increase overall survival or recurrence free survival, it does improve rates of remission and decrease likelihood of disease-related death, particularly in patients with early stage disease and lesions involving the right liver.

8. PERCUTANEOUS GASTROSTOMY IN NECROTIZING PANCREATITIS: FRIEND OR FOE?

Alexandra M. Roch, Rose A. Carr, James L. Watkins, Glen Lehman, Michael G. House, Attila Nakeeb, C. Max Schmidt, Eugene P. Ceppa, Nicholas J. Zyromski
Indiana University School of Medicine

Background: Enteral nutrition plays a central role in managing necrotizing pancreatitis patients. Although the nasojejunal (NJ) route is widely used, percutaneous gastrostomy with jejunal extension (PEG-J) is an alternative technique that is being applied more commonly. The complication profile of these enteral feeding routes has not been compared directly. Based on our clinical observations, we hypothesized that NJ and PEG-J had similar morbidity when used in the setting of necrotizing pancreatitis.

Methods: All patients undergoing surgical debridement for necrotizing pancreatitis between 2005 and 2015 were identified. Those receiving preoperative enteral nutrition were segregated into NJ or PEG-J groups. Patients who had NJ followed by PEG-J had efficacy and safety metrics recorded for the time with each specific feeding method. Efficacy of enteral feeding was measured by the ability to reach nutritional goal, withdrawal from total parenteral nutrition (TPN), and percentage increase in serum albumin concentration. Complications were classified according to the Clavien-Dindo scale.

Results: Two hundred and forty-two patients had complete data for analysis (155 men/87 women, median age 53.5 years). The dominant etiologies for necrotizing pancreatitis were biliary in 47%, and alcohol in 16%. NJ was used exclusively in 187 patients (77%); 25 patients (10%) were fed exclusively by PEG-J; the remaining 30 patients (13%) had NJ first, followed by PEG-J. PEG-J were placed radiologically in 32 (59%) and endoscopically in 23 (42%) patients. Comparing NJ to PEG-J, comparable proportions reached enteral feeding goal (67% vs. 68%, $p=1$), and increased serum albumin concentration (39% vs. 36%, $p=0.87$). Importantly, no difference was seen in rate of necrosis infection (NJ 53% vs. PEG-J 49%, $p=0.64$). NJ patients had a significantly higher overall complication rate compared to PEG-J (51% vs. 27%, $p=0.0015$). However, NJ patients had more grade I/II complications (difficulty to place/repositioning/replacement/clogging/sinusitis), compared to PEG-J patients, who had more grade III/IV complications (perforation/leakage/peritonitis) (Grade I/II: NJ - 100% vs. PEG-J - 60%; Grade III/IV NJ - 0% vs. PEG-J - 40%, $p<0.0001$). Two of the fifty-five PEG-J patients (4%) required urgent operation to manage a severe complication.

Conclusion: In necrotizing pancreatitis, NJ and PEG-J both delivered enteral nutrition effectively. Patients with NJ feeding had significantly more complications than those with PEG-J; however, NJ complications were less severe. Since 11% of PEG-J patients experienced a major/serious complication as a result of the tube placement compared to no patients with NJ tube, the advantages of PEG-J route for enteral nutrition must be weighed carefully against the potential severe complication profile.

9. PEDIATRIC-PROTOCOL MULTIMODAL THERAPY IMPROVES SURVIVAL IN AYAS AND OLDER ADULTS WITH RHABDOMYOSARCOMA

Trevan D. Fischer, Shrawan G. Gaitonde, Bradley C. Bandera, Mehul V. Raval, Sanjeev, A. Vasudevan, Kenneth W. Gow, Elizatheth A. Beierle, John J. Doski, Adam B. Goldin, Monica Langer, Jed G. Nuchtern, Leland J. Foshag, Melanie Goldfarb
John Wayne Cancer Institute

Background: Multimodal therapy (surgery, chemo, radiation) has long been the standard therapeutic protocol for treating pediatric rhabdomyosarcoma (RMS) achieving 70% survival dependent on stage. However, due to the infrequent diagnosis of RMS in adults, adjuvant therapy treatment has been highly variable and survival greatly decreased compared to pediatric patients. This first large national study explores the disparate receipt of multimodal therapy and its impact on survival in different age groups.

Methods: All patients with primary RMS that were not receiving palliative care and had a surgical resection were identified from the 1998-2012 National Cancer Database.

Regression analysis identified independent factors relating to receipt of multimodal therapy. Secondly, the influence of multimodal therapy on 5-year overall survival (OS) was examined in the entire cohort and separately in pediatric, AYA (ages 15-39), and older (>40 years) adults.

Results: Of 2312 patients, 44% were pediatric, 22% AYA, and 34% adult. Younger patients were more ethnically diverse, more likely to be treated at a higher volume (>10 cases/year) center, and presented with less aggressive tumors ($p<.01$). More pediatric patients (62%) received multimodal treatment compared to AYAs (45%) and older adults (24%) ($p<.001$). After controlling for tumor features and stage, older adults were least likely to receive multimodal therapy (OR: 2.2, CI 1.41-3.59) in addition to those with public (OR: 1.3, CI 1.09-1.62) or no insurance (OR: 1.7, CI 1.06-2.87) and those treated in low volume centers (OR:0.7, CI:0.59-0.88). Five-year OS for the pediatric, AYA and adult cohorts was 77%, 55% and 41% respectively ($p<0.001$) with increasing age independently decreasing 5-year OS (AYA HR:1.8, CI 1.36-2.53; adult HR:2.6, CI:1.83- 3.79) on multivariate cox-regression. Public insurance (HR:1.5, CI 1.33-1.79), positive margin (HR:1.4, CI 1.23-1.69) and unfavorable histology (HR:1.3, CI 1.08-1.56) also decreased OS and in AYAs only, Blacks and Hispanics had worse outcomes (Blacks HR:1.7, CI 1.21-2.52; Hispanics HR:1.7, CI 1.18-2.53). Receipt of multimodal therapy conferred a 10% 5-yr OS benefit (48% vs 38%, $p<0.002$) in older adults. In the entire cohort, multimodal therapy was associated with a 26% improvement in 5-year OS (HR:0.74, CI 0.64-0.87) and had incremental significance after stratification by age group (pediatric HR:0.6, CI 0.48-0.85; AYA HR:0.7, CI 0.55-0.95; Adult OR:H.7, CI 0.58- 0.93).

Conclusion: This is the first large national study to demonstrate the survival benefit of multimodal therapy in adult patients with RMS. Although age continues to be an important prognostic indicator for RMS, older patients do derive a significant improvement in survival with a pediatric treatment regimen though they are the least likely to receive the treatment. Implementation of multimodal therapy to all ages could significantly improve the overall outcomes of RMS.

10. THE ONSET OF COAGULATION FUNCTION RECOVERY IS DELAYED IN SEVERELY INJURED TRAUMA PATIENTS WITH VENOUS THROMBOEMBOLISM

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Background: Altered coagulation function after trauma may contribute to venous thromboembolism (VTE) development. Severe trauma temporarily impairs coagulation function, but the trajectory for recovery is not known. We hypothesized that enhanced, early recovery of coagulation function is associated with increased VTE risk in severely injured trauma patients.

Methods: The Pragmatic Randomized Optimal Platelet and Plasma Ratio (PROPPR) trial randomized 680 severely injured trauma patients from 12 level 1 trauma centers to receive 1:1:1 or 1:1:2 ratios of plasma: platelets: red blood cells (RBCs). We performed a post-hoc analysis of these data. Patients who died within 24 hours and/or were prescribed anticoagulants were excluded. Baseline characteristics, adverse outcomes, and total blood products over 24 hours were compared between VTE and non-VTE patients. Multiplate aggregometry (contribution of arachidonic acid (ASPI), adenosine-5'-diphosphate (ADP), collagen (COL), von Willebrand Factor (RISTO), and glycoprotein 11b/11c (TRAP) to platelet function (PF)) and thrombelastography (TEG) parameters (clot time to initiation (R), formation (K), rate of formation (α), strength and index of PF (MA), and lysis (LY30)), were compared over time between groups. $p < 0.05$ indicated statistical significance.

Results: Age, sex, body mass index, mechanism of injury, and injury severity were similar between VTE ($n=83$) and non-VTE ($n=475$) patients. Over the initial 24hrs, VTE patients received more RBCs ($9(7-15)$ v $8(7-15)$, $p < 0.05$) and plasma ($7(4-12)$ v $5(2-10)$, $p < 0.05$), but similar platelets ($6(6-12)$ v $6(6-18)$, $p = 0.34$). Both groups exhibited similar admission PF activity, and inhibition of all PF parameters at 2hrs ($p < 0.05$). The onset of PF recovery (a significant rise in PF compared to 2hrs) was delayed in VTE patients, specifically for ASPI (72 v 4 hrs), ADP (72 v 12 hrs), and COL (48 v 12 hrs). Changes in TEG R, K, α, and MA from admission to 2hrs indicated increasing hypocoagulability ($p < 0.05$), but suppressed clot lysis (low LY30) in both groups. Similar to PF, delayed normalization of MA (24 v 12 hrs) and LY30 (48 hrs v 12 hrs) occurred in VTE patients. VTE patients had lower mortality (4% v 13%), but increased total hospital days ($30(22-30)$ v $16(8-28)$, $p < 0.05$). Adverse outcomes were prevalent in VTE patients ($p < 0.05$), including systemic inflammatory response syndrome (82% v 72%), acute kidney injury (36% v 26%), infection (61% v 31%), sepsis (60% v 28%) and pneumonia (34% v 19%). However, regression analysis showed VTE was only associated with total hospital days (OR: 1.12 (1.08 to 1.16)). VTE, PF, TEG, and adverse events were similar between PROPPR groups.

Conclusion: Despite similar injury severity, VTE patients had more hospital days and received more blood products. Contrary to our hypothesis, recovery of PF, MA and LY30 were delayed in VTE patients. Suppressed clot lysis and other compensatory mechanisms associated with altered coagulation may potentiate VTE formation and require further investigation.

11. BOWEL OBSTRUCTION IN ADVANCED CANCER PATIENTS: VARIABLES ASSOCIATED WITH OUTCOME AND SURVIVAL

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Background: The purpose of this study was to analyze variables associated with presentation, treatment, and outcome in patients with advanced cancer and symptoms of bowel obstruction to identify indicators of outcome and survival.

Methods: The medical records of 490 patients with advanced cancer who underwent surgical consultation for bowel obstruction between January, 2000, and May, 2014, were reviewed. Chi-square and logistic regression analysis were used to identify variables associated with outcome and survival.

Results: The site of obstruction was identified as gastric outlet in 78 patients (16%), small bowel in 312 (64%), and large bowel in 100 (20%). Obstruction etiology was identified as tumor-related in 334 patients (68%), adhesion-related in 96 (20%), and unclear in 60 (12%). Almost half of all patients (N=227, 46%) had received chemotherapy within 6 weeks of their consultation, but only 18 (4%) were neutropenic. Treatment was classified as medical management in 242 patients (49%), surgical in 158 (32%), and procedural (interventional radiology or endoscopy) in 85 (17%). Outcome measures of eating at the time of discharge and death within 90 days of consultation were identified in 334 patients (68%) and 208 (42%), respectively. On multivariate analysis, an intact primary/local recurrence (OR 0.46; 95% confidence interval [CI] 0.3-0.73), carcinomatosis (OR 0.34; 95% CI 0.22-0.52), and albumin level of <3.5 g/dL (OR 0.55; 95% CI 0.36-0.84) were negatively associated with eating at discharge. Variables associated with death within 90 days of consultation on multivariate analysis included having an intact primary/local recurrence (HR 1.73; 95% CI 1.31-2.27), carcinomatosis (HR 1.98; 95% CI 1.44-2.71), and abdominal visceral metastasis (HR 1.75; 95% CI 1.34-2.28). Compared with procedural treatment, medical management (HR 0.51; 95% CI 0.34-0.76) and surgical management (HR 0.44, 95% CI 0.29-0.67) were negatively associated with death within 90 days.

Conclusion: The limited survival for patients with advanced malignancy and bowel obstruction supports a selective approach to management utilizing nutritional and imaging parameters. The lack of independent association of surgery with the ability to eat at discharge highlights the need for future research into this difficult clinical scenario.

12. ADVERSE EFFECT OF POSTDISCHARGE CARE FRAGMENTATION ON OUTCOMES FOLLOWING READMISSIONS AFTER SURGERY

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Background: Postdischarge surgical care fragmentation is defined as readmission to any hospital other than the hospital at which the surgery was performed. Such fragmentation can disrupt postoperative care coordination and adversely affect outcomes in the year following surgery. The objective of this study was to assess the impact of fragmented readmissions within the first year following orthotopic liver transplant (OLT) and identify factors that may necessitate transfer to the index transplant center.

Methods: The Healthcare Cost and Utilization Project State Inpatient Databases (HCUP SID) for Florida and California between 2006 and 2011 were used to identify patients that underwent OLT. Patients experiencing inpatient mortality during index admission or who were not readmitted within one year were excluded. Postdischarge fragmentation was defined as any readmission to a non-index hospital, including readmitted patients ultimately transferred to the index hospital after 24 hours. Outcomes included adverse events defined as 30-day mortality and 30-day readmission following a fragmented readmission. All statistical analyses considered a hierarchical data structure and were performed with multilevel, mixed-effects models.

Results: A total of 2,996 patients with 7,485 readmission encounters at 299 hospitals were analyzed. 1,236 (16.5%) readmissions were fragmented. Following adjustment for age, sex, reason for readmission, cost of index liver transplant, readmission length of stay, number of previous readmissions, and time from transplant, postdischarge fragmentation increased the odds of both 30-day mortality (OR 1.75, 1.16 -2.65) and 30- day readmission (OR 2.14, 1.83 -2.49). Predictors of adverse events following a fragmented readmission included: increased number of previous readmissions (OR 1.07, 1.01 -1.14) and readmission within 90 days of OLT (OR 2.19, 1.61 -2.98).

Conclusion: Postdischarge fragmentation significantly increases the risk of both 30-day mortality and subsequent readmission after a readmission in the first year after OLT. More inpatient visits prior to a readmission and less time elapsed from index surgery increased the odds of an adverse event following discharge from a fragmented readmission. These parameters could guide transfer decisions for patients with postdischarge fragmentation.

13. LYMPH NODE POSITIVITY IN APPENDICEAL ADENOCARCINOMA: SHOULD SIZE MATTER?

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Background: The management algorithm for appendiceal adenocarcinoma is not well defined and classically has been based on tumor size, rather than depth of invasion (T stage). Small tumors (<1cm) are often treated with appendectomy alone. The purpose of this study was 1) to examine if there is an association between tumor size and T stage and 2) to determine whether tumor size or depth of invasion better correlates with the presence of lymph node metastases in appendiceal adenocarcinoma, and 3) to compare these rates of lymph node metastases to colon adenocarcinoma.

Methods: A retrospective review of the National Cancer Database (NCDB) was performed to identify patients with appendiceal or colonic adenocarcinoma from 2004 to 2013 who underwent surgical resection. Cases were categorized by tumor size and by T stage. For appendiceal cases that had sampling of at least 12 lymph nodes, rates of lymph node metastases were examined.

Results: A total of 3,958 appendiceal cases and 314,864 colonic cases were identified. For appendiceal adenocarcinoma, larger tumor size was associated with higher T stage, with an estimated Pearson correlation of 0.41 (95% CI 0.408-0.414, $p<0.001$); lymph node metastases were present in 19.1%, 27.8%, 39.6%, 39.4%, 42.4% and 39.1% for tumor sizes <1cm, >1-2cm, >2-3cm, >3-4cm, >4-5cm and >5cm, respectively; lymph node metastases were present in 0%, 11.2%, 12.3%, 35.5%, and 40.0% for in situ, T1, T2, T3, and T4 tumors, respectively. For colonic adenocarcinoma, lymph node metastases were present in 19.7%, 28.7%, 41.2%, 47.6%, 49.1%, and 48.6% for tumor sizes <1cm, >1-2cm, >2-3cm, >3-4cm, >4-5cm and >5cm, respectively; lymph node metastases were present in 0.9%, 12.4%, 20.9%, 48.7%, and 67.2% for in situ, T1, T2, T3, and T4 tumors, respectively. There was no difference in the rates of lymph node metastases between appendiceal and colonic adenocarcinoma for tumor sizes <1cm ($p=0.835$), >1-2cm ($p=0.692$), and >2-3cm ($p=0.505$), as well as for in situ ($p=0.523$) and T1 ($p=0.651$) tumors. Rates of lymph node metastases are higher in colonic adenocarcinoma for tumor sizes >3cm and for T2, T3 and T4 tumors ($p<0.01$).

Conclusion: Even for small appendiceal adenocarcinomas, the rate of lymph node metastases is substantial at 19% for those <1cm and 27% for those 1-2cm. These rates are similar to those of equally sized colonic tumors. Low T stage (Tis, T1 and T2) is associated with low rates (11-12%) of lymph node metastases, whereas high T stage (T3 and T4) is associated with high rates of lymph node metastases (35-40%). These data suggest that T stage may be a better indicator of lymph node metastases in appendiceal adenocarcinoma. Moreover, it suggests that small appendiceal tumors (0-2cm) may warrant a lymph node dissection to adequately stage and treat appendiceal adenocarcinoma.

14. QUALITY OF LIFE AND TOXICITY OUTCOMES AFTER INTRAOPERATIVE RADIATION THERAPY FOR EARLY STAGE BREAST CANCER TREATED: A PROSPECTIVE STUDY

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Background: Intraoperative radiation therapy (IORT) is a new treatment option for early stage breast cancer. IORT delivers a single dose of targeted radiation at the time of breast conserving surgery (BCS). Compared to six weeks of conventional whole breast radiation, this modality decreases radiation exposure to normal tissues as well as decreases the duration of treatment to one dose. To date, little is known about the impact of IORT on QoL and toxicity profiles. As such, we sought to prospectively assess patient-reported quality of life (QoL) outcomes and clinician-reported toxicity following IORT.

Methods: Fifty three consecutive patients, ages 50-83 years (mean-64), who met institutional criteria for IORT were enrolled since January 2013 to be followed prospectively for 2-years. Criteria for IORT included women > than age 50, invasive ductal hormone positive breast cancer, non-metastatic, T1 (up to 2 cm), with favorable histology. The IntraBeam Radiotherapy system delivered IORT with 50kV of low energy x-rays in a single 20Gy fraction of radiation to the lumpectomy cavity over a mean of 22.26 minutes. Self-administered, validated QoL questionnaires were provided to patients pre-operatively and at 1-week, 1-month, 6-month, 1-year, 1.5-year, and 2-year postoperative appointments. QoL questionnaires included EQ-5D survey, FACT-B +4 (Version 4), FACIT Fatigue Scale (Version 4), and EORTC QLQ-BR23 (Abbreviated). At the same time intervals, clinician-reported radiation-related toxicity evaluations were also performed.

Results: Forty-nine of 53 patients (92%) participated in the study. Median follow up for toxicity data was 6 months while median follow up for QoL data was 1.5 years. 81% of patients received endocrine adjuvant therapy. Patients at all time points reported overall favorable outcomes for physical, social/family, and emotional well-being. At one week post treatment, 37% of patients reported being unable to work which decreased steadily to 13% at 24 months. 21% reported lack of energy at 1 week. This number decreased but rose slightly to 19% at the 1.5 year period. Similarly, there was an increase in slight to moderate anxiety and depression from 23% to 52% at 2 years. These increases were thought to be due to the effect of endocrine therapy.

The majority of reported toxicities were grade 1-2 including breast pain (n= 10; 43%) and breast swelling (n=9; 39%) at one week. There were no Grade 4-5 toxicities. There were only three hematomas and one grade 2 infection reported at 1 week post treatment throughout the study period. At one year postop, the most commonly reported grade 1 toxicities were breast nodularity and indentation (n= 9, n=9; 39%). Palpable nodularity was also the most common Grade 2 toxicity reported at 1 year (n=2; 8.7%) and increased to 31% (n=5) at 2 years. There were very few Grade 3 toxicities reported in this study: seroma (n=1, 6 month), fibrosis (n=1, 2 years), and indentation (n=1, 2 years).

Conclusion: Our results demonstrate the majority of our patients have favorable toxicity and QoL outcomes with no grade 4-5 toxicities, good overall health score, and only 1 local recurrence at 1.5-years. These favorable findings are consistent with recently published studies of this relatively new targeted radiation and further prospective analysis is underway to compare these outcomes to patients receiving conventional whole breast irradiation. IORT is an acceptable way to deliver safe, effective radiation to patients undergoing BCS for early stage breast cancer given its low toxicity profiles and positive QoL outcomes.

15. BETHESDA CATEGORY III, IV THYROID NODULES: CAN NODULE SIZE HELP PREDICT MALIGNANCY?

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Background: The association of tumor size with malignancy in thyroid nodules with indeterminate cytology: atypia/follicular lesion of undetermined significance (AUS/FLUS), suspicious for follicular neoplasm, and Hürthle cell neoplasm utilizing the new Bethesda system has not been clearly studied.

Methods: 1,208 patients who underwent thyroid FNA and subsequent thyroidectomy were identified from our institutional prospective database. Indeterminate cytology was defined as AUS/FLUS, suspicious for follicular neoplasm (SFN) and Hürthle cell neoplasm (HCN). The size of the nodule was determined by preoperative ultrasound measurements. Malignancy was confirmed by final histology of the index nodule. Multivariable logistic regression modeling was performed to determine if increased nodule size was associated with malignancy.

Results: 359 (30%) patients had indeterminate cytology by FNA (AUS/FLUS 64%; FN 24%; HCN 12%). The median nodule size of all indeterminate lesions was 2.2cm (range 0.5- 10cm). The median nodule size of SFN was 2.5cm (range 0.5-10cm), HCN was 2.3cm (range 0.5-9.3cm) and AUS/FLUS was 2.1cm (range 0.7-8cm). On final histology, 68 (20%) of the index lesions were malignant (FN 22%; HCN 24%; AUS 29%; FLUS 17%). On multivariate logistic regression adjusting for patient age and sex, nodule size was not associated with increased odds of malignancy in lesions with indeterminate cytology (OR 1.00, CI 0.83-1.20, $p=0.94$). Additionally, nodule size was not associated with malignancy in the index nodule of SFN lesions (OR 0.93, CI 0.66-1.29, $p=0.69$) or AUS/FLUS lesions (OR 0.79, CI 0.58-1.08, $p=0.15$). Increased nodule size was associated with malignancy in the index nodule of HCN lesions (OR 2.22, CI 1.16-4.25, $p=0.16$)

Conclusion: The findings of this study suggest that nodule size is not predictive of malignancy in nodules with Bethesda categories AUS/FLUS or SFN. Larger HCN nodules are more likely to be malignant. Therefore nodule size alone, should not guide surgical management of patients with AUS/FLUS or SFN but rather the clinical picture, individual institution malignancy rates and molecular testing.

16. BULLYING, ASSAULT AND ABUSE: INJURY PATTERNS IN CHILDREN ADMITTED TO TRAUMA CENTERS

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Background: While assault is commonly reported or suspected in children with traumatic wounds, a recent overview of these injuries, especially those requiring trauma surgery consultation is lacking in the literature. The purpose of this study was to explore the incidence, demographics and injury patterns of children presenting to trauma centers following an assault.

Methods: The National Trauma Databank 2007 to 2011 was queried for subjects up to 18 years old who sustained any type of trauma with “assault” reported as the intent of injury. Patients were divided into infants (<2 years), young children (2-5 years), children (6-11 years) and adolescent (12 to 18 years). Analysis of variance was utilized to explore differences in injury patterns and outcomes between age groups.

Results: Of 609,207 children admitted over the 5-year study period, 58,299 (9.6%) were victims of an assault. The mean age was 12.9 ± 6.7 years and 81.3% were male, with a mean injury severity score (ISS) of 8.8 ± 10.4 . The majority of patients were adolescents (75.6%), followed by infants (17.0%) and young children (4.3%). Assaulted infants and young children were more likely to be white (46.0% and 40.0% vs. 23.2% and 30.9% for black respectively, $p < 0.01$), while assaulted children and adolescents were more likely to be black (41.6% and 46.7% vs. 29.6% vs. 19.6% for white respectively, $p < 0.01$). The majority of infants (84.5%) and young children (69.6%) were victims of a perpetrator of abuse, while the majority of children (33.5%) and adolescents (43.9%) were victims of a firearm injury ($p < 0.01$). After excluding victims of firearm injuries, traumatic brain injury with an abbreviated injury scale (AIS) score ≥ 3 were observed in 31.6% of patients, with a stepwise increase in incidence with decreasing age (infants: 59.5%, young children: 45.8%, children: 21.0% and adolescents: 19.7%; $p < 0.01$). The overall mortality was 2.6%, with 17.6% requiring admission to the intensive care unit and another 17.6% requiring emergent operative intervention.

Conclusion: Up to 10% of children admitted following a traumatic insult are victims of an assault, with traumatic brain injuries being predominant in infants and young children and firearm injuries predominant in adolescents. In contrast to black children, white children are more likely to be assaulted at a younger age. These data provide the trauma surgeon with an overview of injury patterns in assaulted children, and may serve to optimize resource utilization and development of preventative strategies.

17. IMPACT OF LAPAROSCOPIC BARIATRIC SURGERY ON N-TERMINAL PRO B-TYPE NATRIURETIC PEPTIDE: A COMPARISON OF ROUX-EN-Y GASTRIC BYPASS, SLEEVE GASTRECTOMY, AND ADJUSTABLE GASTRIC BANDING

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Background: Coronary artery disease (CAD) is the primary cause of death in the United States, and obesity is the leading preventable CAD risk factor. Previous studies have noted improvements in cardiac risk factors following laparoscopic Roux-en-Y gastric bypass (LRYGB). However, one study demonstrated an increase in N-terminal pro B-type natriuretic peptide (NT-proBNP), a marker of heart failure, following LRYGB. No study to date has examined the effects of laparoscopic sleeve gastrectomy (LSG) or laparoscopic adjustable gastric banding (LAGB) on NT-proBNP levels. This study aimed to assess and compare changes in NT-proBNP following LRYGB, LSG, and LAGB.

Methods: From 2007 to 2014, BMI, cardiac markers, and NT-proBNP levels were measured preoperatively and at 3, 6, and 12 months postoperatively for 279 patients undergoing bariatric surgery [LRYGB (174), LSG (80), LAGB (25)]. Outcomes were compared by repeated paired t-tests or Wilcoxon matched-pairs signed-rank tests as required by the sample data. Linear regressions were used to examine the relationship between BMI and NT-proBNP levels. Multivariate regressions controlling for age and race were used to examine predictors of postoperative changes in NT-proBNP concentration.

Results: For the LRYGB cohort, the concentration of NT-proBNP increased significantly from 64.7 ng/L preoperatively to 105.2 ng/L at 3 months ($p < 0.001$), 156.7 ng/L at 6 months ($p = 0.0003$), and 116.6 ng/L at 12 months ($p = 0.0068$). Percentage of excess weight loss (%EWL) was the only statistically significant predictor of postoperative changes in NT-proBNP; however, after controlling for age and race, the association had a negative effect. For every 1 percent increase in %EWL, NT-proBNP concentration fell 1.77 ng/L ($p = 0.012$). Significant increases in NT-proBNP were not observed in either LSG or LAGB cohorts, and no predictors were significantly associated with changes in NT-proBNP.

Conclusion: All bariatric surgeries led to significant excess weight loss; despite this, neither LSG nor LAGB replicated the surprisingly increased postoperative NT-proBNP concentrations seen in LRYGB. NT-proBNP may be a mechanism associated with weight loss and metabolic changes unique to LRYGB.

18. GENDER-SPECIFIC DIFFERENCES IN COLON CANCER WHEN QUALITY MEASURES ARE ADHERED TO: RESULTS FROM INTERNATIONAL, PROSPECTIVE, MULTICENTER CLINICAL TRIALS

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Background: Although much attention has been given to gender-related differences in colon cancer (CC), as yet there is no consensus on the relationship between gender and tumor location, stage and oncologic outcome. In addition, contemporary data suggest that postoperative follow-up is less consistent in the female population. We hypothesized a gender-specific difference in the biology and management of CC.

Methods: Our cohort was drawn from a database of patients enrolled in international trials of nodal ultrastaging for non-metastatic CC. These trials required strict adherence to surgical and pathological quality measures. Postoperative follow-up included colonoscopy at 1 and 4 years and annual CT scans. Gender-specific differences in tumor biology, location, stage and recurrence were evaluated by Chi-squared, Fischer's exact, and independent t-tests. DFS and OS were assessed by Kaplan-Meier and Cox regression models.

Results: The cohort included 428 males (median age 69 years) and 416 females (median age 70 years). Females had more right-sided ($p=0.03$) and earlier T stage ($p=0.05$) tumors, but there was no gender-based difference in pathologic grade, total LNs retrieved, LN positivity ($p=0.47$) or lymphovascular invasion ($p=0.45$). The overall 4- year disease-free survival (DFS) was comparable in females and males (86.7% and 84.8%, respectively). By multivariate analysis only nodal positivity and cancer recurrence impacted overall survival (OS) ($p=0.008$). Neither gender nor primary tumor location affected DFS or OS.

Conclusion: This is the first prospective study to demonstrate gender-specific differences in location and T stage of CC when surgical and pathological management adhered to strict quality standards. The predominance of right-sided CC in females suggests that flexible sigmoidoscopy may be inadequate for screening/surveillance. Interestingly, earlier stage and right-sided location did not confer a DFS or OS advantage for women. Further studies are needed to determine why females have a higher propensity for right- sided lesions and a potential difference in CC biology.

19. PANCREATIC CYST FLUID VASCULAR ENDOTHELIAL GROWTH FACTOR: HIGHLY ACCURATE IN COMBINATION WITH CARCINOEMBRYONIC ANTIGEN FOR SEROUS CYSTIC NEOPLASM DIAGNOSIS

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Background: Pancreatic cystic lesions such as mucinous cystic neoplasm (MCN) and intraductal papillary mucinous neoplasm (IPMN) have the potential for malignant progression while others such as serous cystic neoplasms (SCN) have very little or no malignant potential. Preoperative differentiation of these lesions can be challenging with existing diagnostic modalities. The development of additional diagnostic tests, specifically biomarkers, is crucial for pancreatic cancer detection and prevention. We recently identified vascular endothelial growth factor (VEGF)-A as a novel pancreatic fluid biomarker for SCN. We hypothesize that combining carcinoembryonic antigen (CEA) with VEGF-A will improve the diagnostic accuracy of VEGF-A.

Methods: Pancreatic cyst/duct fluid was collected intraoperatively from consenting patients undergoing surgical cyst resection with corresponding pathologic diagnoses. Pancreatic fluid VEGF-A and CEA levels were detected by ELISA. Sensitivity and specificity of VEGF-A and CEA alone and in combination were determined. Multivariable logistic regression analysis was performed and receiver operator characteristic (ROC) curve analysis was used to evaluate the diagnostic accuracy of the biomarkers.

Results: One hundred forty nine patients with pancreatic cystic lesions met inclusion criteria. Pathologic diagnoses included pseudocyst (n=14), SCN (n=26), MCN (n=40), low/moderate grade IPMN (n=34), high grade IPMN (n=20), invasive IPMN (n=10) and solid pseudopapillary neoplasm (n=5). VEGF-A was significantly elevated in SCN cyst fluid compared to all other diagnoses ($p<0.001$). With a threshold of $>5,000$ pg/ml, VEGF-A alone has 100% sensitivity and 83.7% specificity to distinguish SCN from other cystic lesions. With a threshold of >10 ng/ml, CEA alone identifies SCN with 96.2% sensitivity and 74.5% specificity. Sensitivity and specificity of the VEGF-A/CEA combination is 95.5% and 100% respectively. Likelihood ratio testing demonstrated significant improvements in the model when CEA and VEGF-A were combined compared to either individually. The c-statistic increased from 0.98 to 1.00 when CEA was added to VEGF-A alone in the ROC analysis.

Conclusion: In high risk patients with pancreatic cysts, there is an urgent need for an accurate and reliable diagnostic test to stratify and improve clinical management. Although VEGF-A alone is a highly accurate test for SCN, the combination of VEGF-A with CEA approaches the gold-standard of pathologic diagnosis, thus importantly avoiding false positives. Patients with a positive test indicating benign SCN can be spared a high risk surgical pancreatic resection.

20. LIVER TRANSPLANTATION FOR PRIMARY PEDIATRIC HEPATIC TUMORS

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Background: Primary pediatric hepatic tumors (PPHTs) are rare and account for approximately 1% of all childhood malignancies. Surgical resection is often not possible due to extensive disease within the liver, leaving transplantation as the only viable option. This is a review of experience with liver transplantation for PPHTs over the past 15 years at a tertiary care center.

Methods: A prospective data-base was reviewed to compare outcomes of pediatric liver transplant recipients with and without cancer.

Results: One hundred and seventy three pediatric liver transplants were performed over the 15 year study period of which, 21 (12.1%) were for PPHTs: 16 had hepatoblastoma (HB), 3 embryonal cell sarcoma (ESC) and 2 hepatocellular carcinoma (HCC). Tumor staging was done using PRETEXT, ALTSG and TNM staging systems for HB, HCC and ECS respectively. Eleven (52%) were male and the mean age at time of transplantation was 4.2 years (58d-17 yrs). Interval from diagnosis to listing was 180 (+/- 285) days and median wait time was 15 days. 3 patients (14.3%) had living donors (LD) and 18 (85.7%) had deceased donor grafts (12 reduced size, 6 whole organ). All patients with HB and ESC received neo-adjuvant chemotherapy. Radiographic response was seen in 17/19 (89.4%) with mean tumor size reduction of 42%. An 88% reduction in mean AFP levels was seen with neo-adjuvant therapy from time of diagnosis (71,193 ng/ml) to time of transplant (8,373 ng/ml). Both HCC recipients received preoperative transarterial chemo embolization (TACE) as a bridge to transplantation. Recurrence was seen in 4 patients (3 HB and 1 HCC). Multivariate analysis identified metastatic HB on initial presentation, and persistently elevated AFP levels after neoadjuvant chemotherapy for HB as risk factors for tumor recurrence. One, 3-, 5- and 10 year post-transplant overall survival rates in patients with PPHT recipients were 95.2%, 81.2%, 81.2% and 81.2% compared to 92.7%, 89.8%, 88.9% and 87.6% (P=0.75) respectively for patients who underwent liver transplants for non-malignant causes during the same period. There was also no significant difference in 1-, 3-, 5- and 10 year graft survivals between the two groups (95.2%, 72.2%, 72.2% and 72.2% in PPHT group vs 85.4%, 81.1%, 80.3% and 75% in non-malignant group) (P=0.77)

Conclusion: Liver transplant is an excellent option for children with unresectable PPHTs and outcomes are comparable to transplantation for non-malignant causes.

Metastatic tumor on initial presentation and persistently elevated AFP levels after neo-adjuvant chemotherapy are risk factors for HB recurrence.

21. RURAL GENERAL SURGERY: A 38-YEAR EXPERIENCE WITH A REGIONAL NETWORK ESTABLISHED BY AN INTEGRATED HEALTH SYSTEM IN THE MIDWESTERN UNITED STATES

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Background: Current workforce shortages for general surgery (GS) in the US are predicted to worsen over the next several decades, particularly in rural areas. Rural GS challenges include professional isolation, onerous call and administrative responsibilities, less competitive reimbursement, and maintenance of adequate case volumes. We report a sustainable model for the provision of GS services within a large rural region that includes a fully integrated health system, centered in La Crosse Wisconsin with over 30 facilities serving 21 counties in Wisconsin, Minnesota, and Iowa. The health system employs more than 700 providers, including 18 general and vascular surgeons who practice at the tertiary teaching hospital in La Crosse.

Methods: A longitudinal study of a rural GS network from September 1978 through May 2016. Employment data and rural GS survey results were reviewed to document methods of rural GS recruitment, retention and development of case volumes.

Results: During the 38-year study period, 19 rural GS were employed by the health system. There were 3 practice acquisitions and 16 new hires. The rural GS network grew from 1 surgeon in 1978 to 10 in 2016. In 1996, the network consisted of 5 rural GS practicing at 5 different critical access hospitals (CAH) within our region. Currently, 9 rural GS have their primary practice at one of 4 CAHs and they provide outreach GS services to an additional 7 CAHs in the region. Outreach services include outpatient GS and endoscopy at 7 CAHs and cesarean section coverage at 4 CAHs. Call coverage and outreach services are shared by the rural GS subgroup (optimal size = 3) in each region. Four (21%) rural GS have retired, 10 (53%) continue to practice in the network (1 in administration); only 5 (26%) left the network prior to retirement. Six rural GS have practiced in one location for > 20 years.

Conclusion: Successful recruitment of rural GS depends upon competitive salary, reasonable call/leave schedule, administrative support, and adequate case variety and volume. Adequate case volume is enhanced by cooperative relationships with CAHs, health system assistance in performing appropriate procedures locally, co- management of selected complex cases, and development of outreach surgical locations. In addition to the aforementioned recruitment principles, rural GS retention is optimized by connectivity with the system tertiary medical center and transparent, bidirectional expectations.

22. A TALE OF TWO CANCERS: TRAVELING TO TREAT PANCREATIC AND THYROID CANCER

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Background: Patients living in urban or rural areas diagnosed with a malignancy are frequently faced with the decision to travel for care at an academic medical center or receive treatment at a nearby hospital for their surgical care. Here, we examine differences in demographics, treatment, and outcomes of those traveling to academic centers for their care versus those not traveling in two malignancies with differing overall prognoses using the National Cancer Database (NCDB).

Methods: Patients with Papillary Thyroid Carcinoma (PTC) or Pancreatic Ductal Adenocarcinoma (PDAC) undergoing surgical resection included in the NCDB were examined as separate cohorts. Travel for care was abstracted from “crowfly” distance between patients’ home zip code and treatment facility, region, county size, urban/metro/rural status, and facility type. Demographic differences were compared using chi-squared and ANOVA analyses. Overall survival was modelled using univariate and multivariate Cox proportions hazards models.

Results: In total, 105,677 patients with PTC and 22,983 patients with PDAC were included for analysis. Compared to those with PTC, patients with PDAC were more likely to travel from both metro (21.4% versus 9.0%, $p<0.001$) and urban/rural counties (45.4% versus 22.2%, $p<0.001$) for their care. Compared to patients with PDAC who did not travel, those who traveled were more likely to have a complete resection and lymph node dissection (LNDX), and were less likely to receive chemo or radiotherapy ($p<0.001$ all).

Survival was improved for patients with PDAC traveling from urban/rural settings (HR=0.89 95%CI [0.82-0.96], $p=0.002$) on multivariable analysis. Patients with PTC who traveled for care were older, more likely to be male, have Medicare insurance, and have a higher stage of disease ($p<0.001$ all). Additionally, rates of RAI were lower, ATA guidelines were more likely followed, and LNDX was more common for those who traveled with PTC ($p<0.001$ all). There were no survival differences between those who traveled and those who did not in the PTC group on multivariable analysis.

Conclusion: Travel from an urban or rural area to an academic center improves both quality of care and survival. In the case of PTC improvements in quality of surgical care are demonstrated by more appropriate adjuvant treatment and care more closely following current guidelines. For patients traveling for the care of their PDAC, they are more likely to receive a complete resection and more likely to undergo a LNDX. In the case of PDAC, these improvements in quality of care translate to improved overall survival for those patients traveling for surgical care.

23. THE VISCOELASTIC FIBRINOLYSIS CHALLENGE: SINGLE LABORATORY ASSAY TO PREDICT MASSIVE TRANSFUSION WITHIN 15 MINUTES

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Background: Early prediction of the need for a massive transfusion (MT) remains a challenge in trauma. To date, no single laboratory or clinical value can accurately predict which patients are at risk. Hemorrhagic shock releases tissue plasminogen activator (tPA). The duration and depth of shock correlates to circulating tPA levels. If tPA levels overwhelm their endogenous inhibitors, systemic hyperfibrinolysis occurs resulting in an uncontrollable coagulopathy. The addition of tPA to a patients' blood samples could, therefore, forecast a patients coagulation status if they remain hypotensive. We hypothesize that a modified thrombelastography (TEG) assay with exogenous tPA, will unmask patients with impending systemic coagulopathy who may require a massive transfusion.

Methods: Blood samples obtained within 30 minutes of injury in the highest trauma activation level were analyzed using TEG with and without tPA (r-TEG) at a low (Lt-TEG) and high dose (Ht-TEG). The following were assessed: maximum clot strength (MA, mm), time to reach MA (TMA, min), and lysis (LY30). Massive transfusion (MT) was defined as requiring greater than 4 units of red blood cells (RBC) per hour during the initial 6 hours of resuscitation or death from shock within this time frame. Clinic scores predicting MT (Shock Index [SI], ABC, TASH) were compared to tPA TEG parameters for predictive value for MT, using their receiver operating characteristic (ROC) curves.

Results: 326 patients were included in the analysis. Median ISS was 26 with 20% of patients receiving a MT. Patients who required a MT had a median SI of 1.1, ABC score 1, and TASH score 12. TEG variables in patients requiring MT were significantly different than those not requiring a MT: r-TEG lower MA ($p < 0.001$) higher LY30 ($p < 0.001$); Lt-TEG lower MA ($p < 0.001$) and higher LY30 ($p < 0.001$); Ht-TEG lower MA ($P < 0.001$) higher LY30 ($P < 0.001$). The correlation between LY30 and other TEG variables was the highest for TMA in both Lt-TEG (spearman's Rho 0.751 $p < 0.001$) and Ht-TEG (0.813 $p < 0.001$). ROC curves indicated that the Lt-TEG (LY30) had the greatest area under the curve (0.870 95%CI 0.805-0.934) for prediction of MT followed by TASH (0.824 95%CI 0.763-0.884). The Ht-TEG TMA had slightly decreased discrimination (0.794 95%CI 0.725-0.863); But a Ht-TEG TMA below 15 minutes was identified as the optimal threshold for predicting massive transfusion with a sensitivity of 80% and specificity of 75%.

Conclusion: The tPA-challenged TEG effectively identifies trauma patients that require MT better than currently used clinical scores. This new methodology is based on the molecular mechanism of trauma-induced hyperfibrinolysis. Moreover, results can be obtained within 15 minutes from a single venous blood sample, making it an appealing test for implementation in the prehospital setting.

24. FACTORS ASSOCIATED WITH NON-HOME DISCHARGE FOLLOWING ARTERIAL BYPASS GRAFTING FOR CRITICAL LIMB ISCHEMIA

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Background: Patients with critical limb ischemia (CLI) often have multiple comorbidities that may preclude a rapid recovery after bypass surgery. Definable pre- and post- operative factors may portend non-home discharge (NHD). Herein, we aimed to determine the association between preoperative and postoperative risk factors associated with non-home discharge following bypass procedures for CLI.

Methods: We examined data from a large multicenter quality improvement vascular surgery registry of all patients undergoing open arterial bypass grafting (n = 3492; BPG) between 2012-2014. Patients were excluded for multiple hospital admissions (n317), missing data (n78), and mortality(n33). All outcomes up to 30 days were recorded using multiple logistic regression model. All regression models had Hosmer-Lemeshow $p > .05$ and area under the receiver operating curve of > 0.8 , confirming excellent goodness of fit and discrimination.

Results: Among 1871 patients undergoing open arterial BPG for CLI, 589 (31.5%) were not discharged to home (Rehabilitation Facility=284, Skilled Nursing Facility=249, other acute care hospital=33, hospice=10 and others=13). Majority of the arterial reconstructions (n1750) were infrainguinal bypass grafts and remaining 121 were proximal reconstructions. Out of 1871 open arterial bpg, 1381 were elective and 490 urgent or emergent. Length of stay was shorter for home discharge (7.5 ± 5.9 days) as compared to those with NHD (14.1 ± 10.4 days) ($p < .001$)*. In hospital outcomes including SSI (13% v. 8%), transfusion (8% v. 4%), amputation (10% v. 1.1%) were all increased for NHD patients (all $P < .01$). Adjusting for major covariates including ASA class, NHD was independently associated with preoperative anemia ($Hg B < 12.0 \text{ gm/dL}$) (OR=1.5; 95%CI = 1.1-2), age (1.04; 1.03-1.06), diabetes mellitus (1.5; 1.2-2), renal failure on HD (3.0, 2-4.6), non-elective procedure (1.7; 1.3-2.3), peri-operative transfusion (2.3; 1.8 - 3), post op pneumonia (3.6; 1.4 - 8.9), postoperative Above Knee/ Below Knee amputation (10.3; 5.6-19.0).

Conclusion: Post-operative non-home discharge after BPG for CLI was associated with preoperative anemia that may be able to be modified prior to surgery. Attention to pneumonia prevention and avoidance of transfusion as post-operative factors may decrease NHD. Early identification of patients with increased likelihood of NHD will reduce resource use.

*t test.

25. LAPAROSCOPIC REPAIR OF RECURRENT INGUINAL HERNIAS OFFERS SIMILAR OUTCOMES AND QUALITY OF LIFE TO PRIMARY LAPAROSCOPIC REPAIR

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Background: Open repair of recurrent inguinal hernias has been shown to result in significantly poorer perioperative outcomes when compared to open primary hernia repair. However, limited data exists comparing primary and recurrent laparoscopic inguinal hernia repair (LIHR). The aim of our study was to compare quality of life trends and clinical outcomes between laparoscopic repair of recurrent and primary inguinal hernias. We hypothesize that unlike open procedures, LIHR does not result in significantly divergent outcomes between these two patient cohorts.

Methods: A retrospective review was conducted of 504 patients who underwent primary LIHR and 84 patients who underwent LIHR for a recurrent inguinal hernia between 2009 - 2015. All cases were performed by four surgeons at a single institution, using totally extra-peritoneal (TEP) technique. Quality of life outcomes were measured using Short Form-36 (SF-36), Surgical Outcomes Measurement System (SOMS), and Carolinas Comfort Scale (CCS) surveys administered pre-operatively and at 3 weeks, 6 months, 1 year, and 2 years post-operatively. Comparisons between primary versus recurrent hernias were made using a chi-square test or t-test. Changes over time were assessed using mixed effects models.

Results: A cohort of 588 patients underwent elective LIHR and completed a validated quality of life survey. Mean age for the recurrent cohort was older than the primary cohort (60.3 vs. 56.7 years, $p = 0.04$). Pain scores, mesh sensation, and movement scores as reported by CCS did not differ between the groups at any post-operative time point. Likewise, post-operative of life measurement using SOMS scores for pain, pain impact, pain quality, fatigue, physical functioning, body image, and satisfaction were similar between groups. Recurrence rates (2.1% vs. 0%, $p=0.37$) and readmission rates within 30 days (1.9% vs. 2.9%, $p=0.64$) were not significantly different between the primary and recurrent populations. No significant differences in post-operative infection or urinary retention rates were found but rates of seroma (8.2% vs. 16.9%, $p = 0.02$) and hematoma (2.2% vs. 7.8%, $p=0.02$) formation were higher in the recurrent group.

Conclusion: In contrast to open repair of recurrent inguinal hernia, when laparoscopic repair of recurrent inguinal hernia is compared to primary LIHR, it is not associated with higher recurrence, postoperative pain or complication rates other than seroma and hematoma formation. More importantly there is no difference in short- or long-term quality of life between the two groups.

26. PREGNANCY ASSOCIATED MELANOMA IS NOT ASSOCIATED WITH ADVERSE OUTCOMES

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Background: Melanoma is the most common malignancy encountered during pregnancy, accounting for 31% of all malignancies in the intrapartum period. Several early clinical reports suggested that pregnancy had an adverse impact on the clinical course of melanoma patients, either due to hormonal influences or to later detection. More recent large population based analyses have suggested there was no such impact, but these reports generally lack granular detail regarding patient characteristics and recurrence information. These conflicting data have led to ongoing confusion regarding pregnancy in the media and among the public. The objective of this study was to query a large and detailed single institution melanoma database to better characterize both the clinical presentation of PAM and its prognostic implications.

Methods: Female patients of reproductive age (18-50) (n=2784) with American Joint Committee on Cancer stage 0-IV cutaneous melanoma were identified from our prospectively maintained database. Clinical and histopathologic factors were analyzed using T-test was to compare age at diagnosis, parity, and Breslow thickness. Chi-square test was used for categorical variables. Univariate and multivariate cox regression analysis was used to identify clinically relevant prognostic factors. Kaplan- Meier survival curves were then plotted for overall survival (OS) and melanoma specific survival (MSS), and compared using the log-rank test.

Results: There were 202 patients (7.26%) with PAM. Clinical presentation of melanoma was similar for PAM and non-PAM patients with no significant differences in Breslow thickness (1.67 mm vs. 1.49 mm, $p=0.17$), Clark level, primary tumor site or pigmentation characteristics. Age was greater in the non-PAM patients (36.9 vs 31.5 years, $p<0.001$). There was no significant difference in stage at diagnosis. Parity was significantly increased in the PAM group, $p=0.004$. There was no significant difference in recurrence between the two groups; for PAM patients, 45.1% of patients recurred as compared to 42.2% in non-PAM group, $p=0.433$. For the PAM group, median OS was 38.5 years and was not reached for the non-PAM group. No differences in MSS or OS were identified on regression analysis between PAM and non-PAM patients ($p=0.542$ and $p=0.687$ respectively).

Conclusion: This, the largest, single-institution study examining the characteristics and outcomes associated with PAM, demonstrates no significant difference in the clinical presentation of PAM and non-PAM among women of child-bearing age. We also observed no difference in either recurrence or MSS between the two groups. Pregnant patients should be screened for melanoma in a similar manner to non-pregnant patients and should be counseled that their prognosis is not adversely affected by their pregnancy.

27. OPERATING ROOM FIRES AND SURGICAL SKIN PREPS

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Background: Operating room fires are never events that remain an under-reported source of devastating complications. Surgical fires are commonly a result of alcohol-based surgical skin preparations (fuel) combined with electrosurgery (heat source) and oxygen. The manufacturer guidelines recommend at least a 3-minute delay following application of any alcohol-based solution in order to minimize fire risk. No data exists in the surgical literature evaluating these recommendations or the flammability of common surgical preps. The OBJECTIVE was to quantify the fire risk of common surgical skin preps. Our hypothesis is that there are surgeon-modifiable factors which can reduce the risk of operating room fires.

Methods: A standardized, ex vivo model was created with a 4cm² section of clipped, porcine skin. The heat source was a hand-held “Bovie” pencil activated for 2 seconds on 30W coag mode with room air oxygen. Alcohol based surgical preps studied were: 70% isopropyl alcohol with 2% chlorhexidine gluconate (Chloroprep), and plain 70% isopropyl alcohol. Non-alcohol based surgical preps studied were: 4% chlorhexidine gluconate, and 1% iodine paint. Preps were tested immediately after application (0 minutes) and after a 3 minute delay to allow drying (manufacturer recommendations). Preps were then tested with and without solution pooling. A positive outcome demonstrated a visible flame located near the tip of the Bovie instrument (focal) or a flame the spread across the skin (spreading). Flames were confirmed with thermal imaging. Experiments were repeated 20 times based upon a pre-test probability of 35% difference. Fisher’s exact test was used to compare categorical variables with statistical significance set at $p \leq 0.05$.

Results: Non-alcohol based skin preps (4% chlorhexidine and 1% iodine paint) caused no fires on immediate 0% (0/40) or 3 minute delayed testing 0% (0/40) [similar to control (0%, 0/20; $p=1.0$)]. Alcohol based preps created fires: chlorhexidine gluconate and isopropyl alcohol created 10% (2/20) immediate focal flames and 55% (11/20) focal flames at 3 minutes ($p<0.01$). 70% isopropyl alcohol created flames in 30% (6/20) immediate and 5% (1/40) at 3 minutes ($p=0.01$). When examining pooled prep solution, clinically significant fires (spreading across the skin) occurred using isopropyl alcohol with chlorhexidine gluconate in 85% (17/20) of immediate experiments and 85% (17/20) after waiting 3 minutes ($p<0.01$ vs non-alcohol preps).

Conclusion: Alcohol-based skin preps cause fires. Pooling of alcohol-based skin preps resulted in clinically significant fires spreading across the skin in 85% of cases, even after a 3 minute delay recommended by manufacturer guidelines. Surgeons can decrease the risk of an operating room fire by using non-alcohol based skin preps or avoiding prep solution pooling.



Quick Shot Abstracts

Individual abstracts of the papers to be presented at this year's annual meeting appear on the following pages:

QUICK SHOT ABSTRACTS

QS1. CHARACTERIZATION OF THE INFLAMMATORY RESPONSE WITH PERMISSIVE HYPOTENSION DURING TRAUMA RESUSCITATION

Sarah-Ashley E. Ferencz, Ian E. Brown, M. Austin Johnson, Rachel M. Russo, Lucas P. Neff, J. Kevin Grayson, Timothy K. Williams, Joseph M. Galante
University of California, Davis

Background: Permissive hypotension via restricted fluid resuscitation has been shown to potentially decrease mortality following traumatic hemorrhage. The proposed mechanism is that less fluid decreases coagulopathy, increases clot stabilization, and ultimately decreases blood loss. However, fluid resuscitation may cause iatrogenic pathophysiology associated with reperfusion. The release of inflammatory mediators into the systemic circulation through reperfusion represents a potentially pathologic mechanism that may be modulated by defined fluid resuscitation strategies. We hypothesized that reperfusion from resuscitation would increase the systemic cytokine burden during controlled hemorrhage.

Methods: Twenty-two swine were anesthetized, instrumented, and subjected to controlled hemorrhage with either no resuscitation ("NR", n=15, 67%±7% hemorrhage), resuscitation with Lactated Ringer's at 10mL/kg/hr ("LR", n=5, 25% hemorrhage) or sham. Hemodynamic data and blood samples were collected at baseline, 30 and 60 minutes. Serum was evaluated for interleukin (IL)-6, IL-8, IL-10 and tumor necrosis factor (TNF)-alpha levels and data analyzed with Wilcoxon rank sum tests.

Results: IL-6 was statistically different between NR and LR groups at 30 minutes (18.8 ±0.08 vs 100.8 ±81.4, respectively; p<0.01) and 60 minutes (18.8 ±3.6 vs 268.1 ±262.4; p<0.01). Baseline TNF-α levels were highly variable, and the increase from baseline was not significant between groups (NR 9.9 ±10.2, LR 65.8 ±133.0; p=0.10). There were no differences in IL-8 or IL-10 between the groups.

Conclusion: Fluid administration for the treatment of hemorrhage increases the systemic concentration of inflammatory cytokines, even in cases of moderate bleeding. While the clinical implications of rising cytokine levels in this model have not yet been directly determined, elevated cytokine levels likely correlate with more severe injury. Permissive hypotension may serve not only to reduce coagulopathy and bleeding, but also attenuate the circulating cytokine burden caused by reperfusion. Decreased cytokine production in the setting of permissive hypotension likely reflects diminished washout of cytokines from reduced tissue perfusion, but may also represent lower production through mitigation of reperfusion injury. Characterizing the cytokine burden associated with resuscitation and its clinical significance may lead to the development of adjuncts to resuscitation strategies that improve outcomes in trauma.

QS2. MODIFIABLE DECEASED ORGAN DONOR CRITICAL CARE PARAMETERS IMPACT DONOR HEART UTILIZATION AND TRANSPLANT RECIPIENT SURVIVAL: AN ANALYSIS FROM UNOS REGIONS 4, 5, AND 6

Sarah-Ashley E. Ferencz, Ian E. Brown, M. Austin Johnson, Rachel M. Russo, Lucas P. Neff, J. Kevin Grayson, Timothy K. Williams, Joseph M. Galante
VA Portland Health Care System

Background: There is a shortage of organs available for transplantation, yet only 30% of hearts from donors after neurologic determination of death (DNDDs) are currently utilized. The current models used to predict donor heart utilization and heart recipient survival all lack donor management critical care data. Therefore, we sought to identify novel modifiable predictors in the donor that are associated with increased heart utilization and transplant recipient survival in efforts to ultimately optimize donor management and improve recipient outcomes.

Methods: A prospective, observational study of ten organ procurement organizations in UNOS Regions 4, 5, and 6 from June 2008-November 2013 was conducted. Donor demographic data along with treatments and critical care parameters that reflect the normal hemodynamic, acid-base, respiratory, endocrine, and renal status of DNDDs were collected at 3 time points during the donor management process. The two outcome measures were: (1) donor heart utilization and (2) long-term transplant recipient survival. Multivariable logistic regression was used to identify independent predictors for each outcome measure, with the survival model adjusted for known recipient risk factors derived from the Scientific Registry of Transplant Recipients (SRTR) standard analysis file.

Results: From 3433 DNDDs, 1134 (33%) hearts were transplanted and 976 (86%) recipients were alive after 683 +/- 392 days. After multivariable analysis, independent predictors of heart utilization included standard criteria donor status (OR=3.99), male sex (OR=1.69), ejection fraction > 50% (OR=1.66), PaO₂:FiO₂ > ratio 300 (OR=1.03), younger age (OR=0.94 per year), BMI > 30 kg/m² (OR=0.78), lower creatinine (OR=0.83 per mg/dL) and lower thyroid hormone dose (OR=0.98 per mcg/hr). Conversely, on analysis of long-term transplant recipient survival, higher thyroid hormone dose was found to be an independent predictor (OR=1.04 per mcg/hr).

Conclusion: Donor demographic and, more importantly, modifiable critical care data predict heart utilization and recipient survival. Further investigation of the paradoxical relationship between thyroid hormone dose and decreased heart acceptance (OR=0.98) versus increased recipient survival (OR=1.04) are warranted to inform donor optimization and transplant outcomes.

QUICK SHOT ABSTRACTS CONTINUED

QS3. REINTERVENTIONS FOR POSTCAROTID ENDARTERECTOMY STROKE

Sarah-Ashley E. Ferencz, Ian E. Brown, M. Austin Johnson, Rachel M. Russo, Lucas P. Neff, J. Kevin Grayson, Timothy K. Williams, Joseph M. Galante
Henry Ford Macomb Hospital

Background: The aim of this study is to describe causes and management of stroke following carotid endarterectomy (CEA).

Methods: 2896 consecutive primary CEA'S were performed in two midsize teaching hospitals with data kept in vascular registries on a continuous basis. General anesthesia (GA) was selected in 2146 patient and cervical block anesthesia (CBA) in 750 patients. Indications for CEA were:

- A: Focal transient ischemic attack including transient monocular blindness = 1156 (40%)
- B: Ipsilateral middle cerebral ICA stroke with good recovery = 290 (10%)
- C: Asymptomatic greater than 80% ICA stenosis = 1450 (50%)

All patients sustaining postop neurological deficits were evaluated by a neurologist and outcome up to 30 days are reported. NIH stroke scale was used to describe the neurological status (less than 4 = good recovery, 5-15 = moderate recovery and greater than 15 = poor recovery). Indwelling shunt was used if the stump pressure was less than 40 mmHg or ischemic changes were observed in EEG under general anesthesia or development of neurological deficit with carotid cross clamping under cervical block anesthesia (CBA).

Results: 61 (2.1%) patients (35 men) sustained postoperative stroke. Mild postoperative stroke with complete neurological recovery was observed in 19 (0.7%) patients. The remaining 42 (1.4%) patients had major postoperative stroke. Indications for CEA included (n61):

- A. Focal transient ischemic attack and transient monocular blindness = 27 (44%).
- B. Ipsilateral MCA branch stroke with good recovery = 6 (10%).
- C. Greater than 80% asymptomatic ICA stenosis = 28 (46%).

Mean age of patients 66 +/- 9 years (47-82 years). Comorbidities included coronary artery disease 52 (76%) hypertension 42 (67%), diabetes mellitus 7 (11%), nicotine abuse 55 (90%). High termination of ICA plaque (at or above the C2 vertebral body) in four and contralateral ICA occlusion was present in seven patients. Indwelling shunt was used in eight patients (13%). Completion arteriogram following CEA was performed in 14 patients.

A) Intracerebral hemorrhage occurred in six patients 3 to 96 hours post operatively. Two patients underwent craniotomy. Moderate recovery occurred in two and good recovery in one with mortality in three.

B) Ischemic infarct unrelated to operated carotid artery occurred in three. Two from contralateral ICA and brain stem infarct in one.

C) Shunt malfunction (cerebral ischemia) in two with good recovery in one and poor recovery in the second and eventual death.

D) Stroke due to CEA site thrombus (n18) occurred 6 hours to 48 hours after CEA. Re exploration of CEA site was performed in 16 with good recovery in five, moderate recovery in five and poor recovery in eight with mortality in four.

E) Stroke due to embolization (n13) occurred intraoperatively to 6 hours postoperatively. Neurovascular intervention for middle cerebral occlusion in two and medical management in eleven with good recovery in two; moderate recovery in seven and poor recovery in four with mortality in three patients.

Conclusion: Immediate reexploration of CEA site in patients with post CEA thrombosis resulting in major neurological deficit, neurovascular intervention for embolic MCA trunk occlusion and craniotomy for intracerebral hemorrhage in select group of patients can result in good neurological recovery in about one third of patients. However, major post CEA stroke is associated with high mortality (33%).

QS4. LAPAROSCOPIC REDO ANTIREFLUX SURGERY IS MORE COST EFFECTIVE THAN OPEN REPAIR

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McGovern Medical School at UT Health

Background: We previously showed that redo laparoscopic hiatal hernia repair is a safe approach with low morbidity, high patient satisfaction, and similar outcomes compared to open repair. The aim of the study was to compare the costs of the laparoscopic and open approach in a specialized esophageal center

Methods: Retrospective chart review. Financial and procedure coding data were obtained using a cost accounting system

Results: From 09/02/2010 to 10/26/2015, there were 49 redo antireflux procedures in 46 patients: 36 females and 10 males. One patient who underwent redo transabdominal repair in another hospital was excluded. Values are presented as median and interquartile range (IQR); the costs are presented as mean. The redo procedures included 38 laparoscopic (including 4 conversions) and 11 open procedures: 7 transabdominal fundoplication and 4 Roux-en-Y esophagojejunostomy.

The 7 transabdominal approach was selected as the result of failed prior transabdominal approach in 2/7, failed prior laparoscopic approach in 3/7: 1 had other open abdominal surgery and 2 were performed emergently, and in 2/7 for the presence of recurrent large paraesophageal hiatal hernia. Of the four Roux-en-Y esophago-jejunostomy cases: 2/4 had 3 prior failed antireflux procedures, including one transthoracic repair; and 2/4 had 2 prior failed antireflux procedures, including 1 transthoracic repair. For the laparoscopic versus open group: The median age: 54 (49- 67) vs. 56 (50-65), $p=0.675$. The average direct costs per case: \$12,655 vs. \$24,636, ($p<0.002$). The average direct costs per case included operating room: \$3788 vs. \$5,547, ($p=0.011$), hospital room: \$1,948 vs. \$6,438, ($p<0.005$), laboratory: \$719 vs. \$2,602 ($p<0.006$), radiology \$224 vs. \$637, ($p<0.006$), pharmacy: \$528 vs. \$1,628, ($p=0.013$), respiratory: \$649 vs. \$1,535, ($p=0.012$), ancillary: \$344 vs. \$767 ($p=0.012$), supplies: \$4386 vs. \$5386, ($p=0.077$). The duration of the operation: 185 (147-254) vs. 308 (259-416) min, ($p<0.002$). The post-operative length of stay (LOS): 3 (2-4) vs.9 (8-14) days, ($p<0.001$).

There was no 30-day mortality. Excluding the 4 Roux-en-Y procedures, for the laparoscopic vs. transabdominal group ($n=7$): The average direct costs: \$12,655 vs. \$23,701, ($p=0.035$), the median duration of operation: 185 (147-254) vs.292 (218-309) min, ($p=0.003$), LOS: 3 (2-4) vs.9 (7-15) days, ($p=0.017$). Reoperation for recurrent hiatal hernia was required in 3 patients in the laparoscopic group at 6, 24 and 27 months with the average costs of \$14,153 per patient.

Conclusion: While laparoscopic redo antireflux surgery provides similar outcomes to open procedure, it is a more cost effective approach compared to open repair. The redo laparoscopic approach, when feasible, should be considered as the surgical option for the treatment of recurrent hiatal hernia in specialized esophageal centers.

QS5. IS THERE A “SMOKERS PARADOX” AMONG PATIENTS WITH CHEST TRAUMA?

Sarah-Ashley E. Ferencz, Ian E. Brown, M. Austin Johnson, Rachel M. Russo, Lucas P. Neff, J. Kevin Grayson, Timothy K. Williams, Joseph M. Galante
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Background: Although smoking has been associated with chronic respiratory diseases, impaired immunity and attenuated stress responses, the association between smoking and clinical outcomes among patients with chest trauma has not been examined. We hypothesized that smoking will be associated with adverse outcomes among chest trauma patients.

Methods: We identified patients 18 years and older with International Classification of Disease, 9th edition (ICD-9) diagnosis codes corresponding with chest trauma in the California State Inpatient Database, 2007 - 2011 and extracted matching hospital information from the American Hospital Association database. Demographic, admission and hospital characteristics were included. Patients who smoked were identified using ICD-9 codes associated with tobacco use. Outcomes were in-hospital mortality, respiratory failure, pneumonia, sepsis, and 30-day readmission. Descriptive statistics and multivariate logistic regression analyses were performed to evaluate differences in outcomes associated with smoking. Models were adjusted for age, sex, race, insurance type, Charlson Co-morbidity Index, injury severity score, hospital length of stay, hospital teaching status, trauma center designation, and hospital bed size. Effect modifications by age and injury severity were assessed by stratification.

Results: There were 42,333 patients with chest trauma included in the study and 7,310 (17.27%) reported smoking. Smokers were more likely to be male (75.3% vs. 68.9%), white (70.5% vs. 58.2%), younger (median age: 54 years vs. 59 years), have injury severity scores ≥ 15 (71.6% vs. 63.6%) and have Charlson Co-morbidity Indices ≥ 2 (12.9% vs. 8.5%) (all $P < 0.001$). Compared to non-smokers, smokers had lower rates of hospital mortality (1.6% vs. 4.5%), respiratory failure (9.4% vs. 12.5%), and sepsis (1.5% vs. 2.4%) (all $P < 0.001$); and higher 30-day readmission rates (7.9% vs. 6.9%, $P = 0.002$). In the multivariate analyses, smoking was associated with lower odds of hospital mortality (adjusted Odds Ratio: 0.37, 95% CI: 0.29 - 0.47), respiratory failure (0.77, 0.68 - 0.89), and sepsis (0.73, 0.57 - 0.94), and no differences in pneumonia or readmission rates.

Stratification by age and chest injury severity showed that the observed associations were more pronounced in patients less than 65 years old and patients with Chest Abbreviated Injury Scale (AIS) ≥ 3 .

Conclusion: Contrary to our hypothesis, smoking was associated with lower hospital mortality, respiratory failure and sepsis among patients with chest trauma, particularly those younger than 65 years and those severely injured. These results highlight the need for an improved understanding of the effects of tobacco use among trauma patients.

QS6. BILIARY TRACT CANCER XENOGRAPHS: SURGEON IMPACT ON INDIVIDUALIZED MEDICINE

Sarah-Ashley E. Ferencz, Ian E. Brown, M. Austin Johnson, Rachel M. Russo, Lucas P. Neff, J. Kevin Grayson, Timothy K. Williams, Joseph M. Galante
Mayo Clinic

Background: Biliary tract tumors are uncommon, devastating cancers with poor survival outcomes. Due to low incidence, research into effective therapeutics is challenging. Novel platforms for pre-clinical studies are desperately needed. Patient-derived xenografts (PDX) utilize immunocompromised mice to incubate human tumors for translational research. Studies utilizing PDX have shown better correlation with clinical outcomes than those utilizing cell lines or transgenic animal models. Previous attempts at developing PDX from biliary cancers have not had significant success. We sought to develop a surgeon-directed biliary cancer PDX catalog.

Methods: With institutional approval, informed consent and diagnostic confirmation, cancerous tissue from surgical resection (N=39) or radiologic biopsy (N=9) was implanted subcutaneously in immunocompromised mice. Mice were monitored for PDX growth and metrics were calculated: time to tumor formation (TTF), time to harvest (TTH), overall patient take rate (OPTR), and engraftment efficiency. Established PDX were verified by a hepatobiliary pathologist for tumor histomorphology and immunohistochemistry compared to original patient tissue through multiple generations. PDX growth metrics were correlated with original patient/tumor characteristics and oncologic outcomes. PDX were genomically characterized with next-generation mate-pair sequencing.

Results: Between 1/2013 and 12/2015, 48 patients with histologically confirmed biliary carcinoma were enrolled (9 Gallbladder, 22 Intrahepatic, 9 Hilar, 8 Distal). Median ischemic time for surgical cases was 35 minutes vs. 30 for radiologic biopsy. Median follow-up time was 8.2 months [IQR 3.8,18.9]. 26 implantations produced viable PDX for an OPTR of 54.2% (surgery 61.5%, radiologic biopsy 22.2%). OPTR for patients undergoing neoadjuvant therapy was 28.5%. Median TTF/TTH, and engraftment efficiency were 42/117 days and 61% respectively. Histologic recapitulation of original patient tumor morphology was observed in all PDX. Patients whose tumors successfully engrafted had greater likelihood of recurrence (47.8% vs. 12.5%, $p=0.05$), but there was no correlation between engraftment and tumor size, grade, lymph-vascular invasion, node status, or sub-type. Mate-pair analysis revealed a high level of purity and matching genomic characteristics to the original patient tumor. TTF/TTH data from the PDX program was used in at least 2 cases to direct adjuvant therapy after curative-intent resection.

Conclusion: This is the largest reported series of biliary cancer PDX, demonstrating high engraftment success. PDX engraftment is superior for surgically vs. radiologically acquired specimens. Histologic and genomic analysis of patient-derived PDX demonstrates accurate recapitulation of original tumor microstructure and genomic mutations. Development of biliary cancer PDX is feasible, and a surgeon-directed program is critical for technical success. Such programs provide direct translational application to individualized medicine.



ePoster Abstracts

Individual abstracts of the papers to be presented at this year's annual meeting appear on the following pages:

P1. ACUTE CHOLECYSTITIS OR SOMETHING MORE? WHEN TO SUSPECT CONCURRENT CHOLEDOCHOLITHIASIS

Rubina Tahmazyan, Michele Fujimoto, Raoul Burchette, Philip Haigh, Talar Tejirian, J. Craig Collins
Kaiser Permanente Los Angeles Medical Center

Background: Acute calculous cholecystitis and choledocholithiasis are well-recognized sequelae of cholelithiasis. While these disease processes have been individually studied and characterized, literature on concurrent acute calculous cholecystitis and choledocholithiasis is lacking, with the majority written many decades ago. The aim of this study was to examine the characteristics of patients with concurrent disease and to determine whether or not lab values can be used to differentiate between concurrent disease and individual diseases.

Methods: A retrospective study was conducted to identify inpatient encounters with ICD-9 diagnoses of acute calculous cholecystitis, choledocholithiasis, and concurrent acute calculous cholecystitis and choledocholithiasis in the Kaiser Permanente Southern California regional database over a five year period. For each encounter, data points extracted included demographics, length of stay, and highest lab values (white blood cell count, total bilirubin, aspartate aminotransferase (AST), alanine aminotransferase (ALT), alkaline phosphatase, lipase). Patients with concurrent disease were compared to those with acute calculous cholecystitis and choledocholithiasis alone.

Results: During the study period, there were 1,732 inpatient encounters with concurrent acute calculous cholecystitis and choledocholithiasis, 10,551 with acute cholecystitis, and 7,244 with choledocholithiasis. There was no significant difference between the patient demographics or length of stay for the three groups (average age 50th decade, majority female, about 40% Hispanic, hospitalized 4-5 days). Compared to patients with acute calculous cholecystitis, patients with concurrent acute calculous cholecystitis and choledocholithiasis had a significantly higher total bilirubin (3.84 vs 1.76 mg/dl, $p<0.0001$), AST (258.87 vs 106.11 units/L, $p<0.0001$), ALT (317.60 vs 118.47 units/L, $p<0.0001$), alkaline phosphatase (207.94 vs 121.33 units/L, $p<0.0001$), and lipase (367.50 vs 137.01 units/L, $p<0.0001$). The area under the curve (AUC) for discriminating between these two groups of patients was 0.83. Compared to patients with choledocholithiasis, patients with concurrent acute calculous cholecystitis and choledocholithiasis had a significantly higher ALT (317.60 vs 288.52 units/L, $p<0.001$) and a significantly lower total bilirubin (3.84 vs 5.23 mg/dl, $p<0.0001$) and alkaline phosphatase (207.94 vs 297.00 units/L, $p<0.0001$). The AUC for discriminating between these two groups was 0.64.

Conclusion: Patient with acute cholecystitis, choledocholithiasis, and the combination of the two can all present with liver function derangements. However, the level of derangement needs to be considered to better categorize these patients. When a patient presents with acute cholecystitis, suspicion for concurrent choledocholithiasis needs to be investigated if: total bilirubin >3 mg/dl, AST >200 units/L, ALT >300 units/L, alkaline phosphatase >200 units/L, or lipase >300 units/L. A surgeon may consider preoperative imaging with MRCP or intraoperative cholangiogram in these patients.

P2. EVOLUTION OF ACUTE PERFORATED ULCER DISEASE OVER 25 YEARS

Laura N. Godat, Afonso Neto, Leslie Kobayashi, Raul Coimbra
University of California, San Diego

Background: The H₂-antagonist cimetidine was released in 1976 followed by the first proton pump inhibitor omeprazole a decade later. The introduction of these medications changed the incidence and natural history of gastroduodenal ulcer disease. This study examines trends in the occurrence, surgical treatment, and mortality of acute perforated ulcer disease.

Methods: A review of the National Inpatient Sample (NIS) database for the years 1988 to 2012 was performed. All patients in the database hospitalized with a diagnosis of acute perforated gastric, duodenal or peptic ulcers were identified by ICD-9 diagnosis codes. Procedures analyzed included gastrectomy, vagotomy, pyloroplasty, primary suture repair, exploratory laparotomy only, and percutaneous drain only. Patient factors studied included demographics, Charlson comorbidity, length of stay, and year of admission. Analyses included univariate, bivariate and logistic regressions.

Results: Between 1988 and 2012 39,575 patients with acute perforated ulcer disease were identified. The rate of hospitalization for acute perforated ulcer disease decreased 64.8% over the study period, from 11,127 (1988-1992) to 3,913 (2008-2012). The mean age of patients was 64.7 years and 50.2% were female. Race distribution was 79.8% Caucasian, 10.5% Black, 5.3% Hispanic, 2% Asian or Pacific Islanders, and 0.3% Native American. The proportion of patients with a Charlson comorbidity score of ≥ 3 significantly increased with time from 25.4% in 1988-1992 to 33.3% in 2008-2012 ($p < 0.001$). Despite this, overall mortality declined significantly over the study period starting at 18.6% for the years 1988-1992 and ending at 12.2% for 2008-2012 ($p < 0.001$).

Frequencies in most treatment methods changed significantly over time, when comparing 1988-1992 to 2008-2012. Treatment methods with significantly increased rates were primary suture repair (44.7% to 50.2%, $p < 0.001$), percutaneous drainage only (0.4% to 1.6%, $p < 0.001$) and no reported surgical or procedural intervention (31.6% to 34.4%, $p = 0.02$). Methods that significantly decreased over time were gastrectomy (11.6% to 7.9%, $p < 0.001$) and vagotomy/pyloroplasty (8.2% to 2.6%, $p < 0.001$). The rate of exploratory laparotomy without other procedure reported didn't change over time (3.5% to 3.3%, $p = 0.939$).

Conclusion: The admissions for perforated ulcers have decreased significantly between 1988 and 2012; surgical management of this disease has also changed significantly with an increasing trend toward conservative management. Additionally, despite an increased severity of illness in this patient population the mortality rate significantly decreased.

P3. HOSPITAL RE-ADMISSIONS FOLLOWING DISCHARGE AFTER LIVER TRANSPLANTATION (LT)

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Background: Preventing early hospital readmissions is a focal point in reducing medical costs and improving health care. Our objective was to describe the incidence and causes readmissions within 30 days of discharge following a successful orthotopic liver transplantation (LT).

Methods: Medical records from 1028 consecutive patients who underwent LT between 1/1/1997 and 12/31/2014 at our institution were reviewed and causes of readmissions were analyzed. Pediatric Transplants were excluded.

Results: Between 1/1/1997 and 12/31/2014, 1028 LT were performed, of which 155 (15.1%) were from living donors (LDLT) and 873 (84.9%) from deceased donors (DDLT). 931 patients (90.7%) underwent liver alone transplants and 96 patients (9.3%) patients had simultaneous liver and kidney transplants.

During this time frame of 18 years, a total of 473 (46%) patients were readmitted within 30 days of discharge following an LT. Complete data for analysis was available for 225 patients who received LT between 9/2004 and 12/2014. Of this pool of readmitted patients, 188 patients (83.6%) had received a DDLT versus 37 patients (16.4%) who had LLT. 177 patients (79%) had 1 readmission, 42 patients (19%) had 2 readmissions and 6 patients (2%) had three or more readmissions within 30 days of discharge following an LT. The most common causes of hospital readmissions following an OLT were biliary complications (18%), gastrointestinal complaints (15%) and pulmonary complications (10%). Of the LDLT recipients readmitted within 30 days of discharge, 43% had biliary complications compared to 13% for DDLT recipients, $p < 0.05$. The most common biliary complications amongst these LDLT recipients were bile leaks (50%) and bilomas (31%), while biliary strictures were the most common biliary complication for DD OLT recipients. Compared to LDLT recipients, DDLT recipients were also more commonly readmitted secondary to pulmonary (11% Vs 5%) and hematologic (9% Vs 3%) complications.

Conclusion: Readmissions after OLT represent a significant health care burden, with 46% of patients readmitted within 30 days of discharge. There is need to implement changes in our surgical practice that would reduce preventable readmissions, with goals to improve health care delivery and quality for our patients.

P4. HARTMANN'S PROCEDURE VERSUS PRIMARY ANASTOMOSIS IN DIVERTICULITIS WITH FECULENT PERITONITIS: AN AMERICAN COLLEGE OF SURGEONS-NATIONAL SURGICAL QUALITY IMPROVEMENT PROGRAM ANALYSIS

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Background: Recent evidence has suggested the superiority of primary anastomosis (PA) over diverting colostomy (Hartmann's procedure, HP) in the treatment of complicated diverticulitis, citing decreased complications and death in patients undergoing PA. These retrospective studies have often failed to differentiate patients with feculent peritonitis (Hinchey IV) versus lower-grade disease. We examined a large U.S. surgical database to determine whether patients undergoing emergent operations for perforated diverticulitis, especially those with feculent peritonitis, differed in mortality rate and major complication rate based on whether HP or PA was performed.

Methods: We utilized the National Surgical Quality Improvement Program (NSQIP) Patient User File (PUF) for years 2009-2014. Patients undergoing emergency surgery for diverticulitis were identified using ICD-9 diagnosis codes and CPT procedure codes. Patients were stratified as having undergone either a primary anastomosis (PA) or Hartmann's procedure (HP). Details regarding patients' preoperative status, including medical comorbidities, the presence of preoperative sepsis or septic shock, and nutritional status were incorporated. We compared preoperative factors and postoperative events in both groups with chi-square analyses. Wound class IV (put in a definition if you have space) was used as a surrogate for Hinchey IV or feculent peritonitis. We analyzed patients with wound class IV using multivariable analyses to adjust for confounding variables to determine whether HP and PA patients had differences in the rates of death, sepsis, and organ space surgical site infection (SSI).

Results: Among the 4,426 patients identified, HP patients were older, less likely to have a laparoscopic operation, and more likely to have medical comorbidities, preoperative sepsis and septic shock. Of these patients, 3,415 were graded as wound class IV (PA=665, HP=2750). Unadjusted analysis showed HP patients to have a higher mortality rate (6.6% vs 3.6%, $p=0.004$), a lower rate of organ space SSI (6.6% vs 9.5%, $p=0.01$), and no difference in postoperative sepsis (18.4% vs 17%, $p=0.41$). After adjusting for patient comorbidities, multivariate analysis showed no difference in mortality rate between HP and PA patients (OR 0.83, 95% CI 0.49-1.42) and no difference in the rate of organ space SSI (OR 0.91, 95% CI 0.71-1.16). Multivariate analysis showed HP to be protective from sepsis (OR 0.77, 95% CI 0.59-0.99).

Conclusion: Increasingly, PA is being performed in cases of complicated diverticulitis presenting emergently. This is not without evidence in cases of non-feculent peritonitis (Hinchey III or lower). Using the NSQIP database, we have shown that in cases of feculent peritonitis (Hinchey IV), Hartmann's procedure does not have a higher mortality rate or rate of organ space SSI and is protective from sepsis over PA. Although PA can still be used in non-feculent diverticular perforations, HP should still be strongly considered in Hinchey IV disease.

P5. ETHNIC PARITY IN THE CRITICAL CARE MANAGEMENT OF DECEASED ORGAN DONORS

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Background: Among deceased organ donors there are ethnic differences in the number of organs transplanted per donor (OTPD) but the etiology of the disparity is unknown. Meeting a bundle of preset critical care endpoints, known as donor management goals (DMGs), has been demonstrated to be associated with higher OTPD. We hypothesized that ethnic groups with fewer OTPD will be less likely to meet the DMG bundle after controlling for donor characteristics.

Methods: Data were prospectively collected on all deceased organ donors from ten Organ Procurement Organizations (OPOs) in regions 4, 5, and 6 of the United Network for Organ Sharing Regions during March 2012 to November 2014. Donor types included those after either neurologic or circulatory determination of death. Nine DMG endpoints were recorded at three standardized time points: 1. authorization for organ donation (representing the adequacy of donor hospital care), 2. 12-18 hours into the case (the time that organ offers are being made), and 3. prior to organ recovery (representing the end of the OPO donor management phase). Meeting the DMG bundle was defined as attaining any 7 of the 9 endpoints at any of the three time points. Donor characteristics found to be associated with the outcome (p -value <0.05) on bivariate analysis were included in multivariate logistic regression to test the independent effect of donor ethnicity on meeting the DMG bundle.

Results: Data were collected from 3476 donors: 55% of whom were White, 30% Hispanic, 9% Black, and 6% Asian. Across all donors, 23% initially met the DMG bundle at authorization, 44% 12-18 hours later, and 59% prior to organ to recovery. The proportion of donors meeting the DMG bundle was statistically different across all ethnic groups prior to organ recovery, but not at the earlier time points. Asian donors were most likely to meet the bundle at 67%, followed by Hispanic donors at 62%, and Black and White donors each at 57% ($p=0.002$). In bivariate analyses, donor age, body mass index (BMI), cause of death, donor type (standard criteria, expanded criteria, donor after circulatory determination of death), serum creatinine, thyroid hormone use, and OPO were each found to be associated with meeting the DMG bundle at all three time points (p -values <0.025). In multivariate logistic regression, there were no statistically significant differences in the odds of meeting the DMG bundle between White and non-White donors.

Conclusion: There are ethnic differences in deceased organ donor organ utilization that are not explained by differences in achieving critical care endpoints as represented by meeting the DMG bundle. These findings suggest that donor ethnicity affects organ utilization in an alternate pathway, such as socioeconomic level and regional demographics. Further research on this topic is needed to maximize the utilization of available organs from all groups of donors, thereby helping to address the shortage of organs available for transplantation.

P6. SARCOPENIC OBESITY PREDICTS POOR OUTCOME AFTER HEPATECTOMY FOR COLORECTAL LIVER METASTASES

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Background: Although recent studies suggest that sarcopenia (ratio of skeletal muscle volume to height) correlates with complications after hepatectomy, these studies are confounded by variability in tumor and procedure factors. This study focused on a large cohort of colorectal liver metastasis (CLM) patients surgically treated exclusively with open formal right hepatectomy to isolate the influence of nutritional and physical fitness factors on post-hepatectomy outcomes.

Methods: A prospectively maintained institutional liver surgery database was queried to identify a continuous set of CLM patients treated with right hepatectomy as their first liver directed therapy. Preoperative CT imaging was used to acquire skeletal muscle area, visceral adipose area and subcutaneous adipose area using published techniques and advanced imaging software. These measures were standardized to height (m²) to define the skeletal muscle index, visceral adipose index, subcutaneous adipose index, sarcopenia and sarcopenic obesity. These indices were compared along with patient factors including preoperative chemotherapy, postoperative morbidity and mortality.

Results: 180 patients met the inclusion criteria including 108 men and 72 women with a median age of 57 years. 72.1% received pre-hepatectomy chemotherapy. The prevalence of sarcopenia and sarcopenic obesity was 35% and 17%, respectively. Cohort outcomes included severe complication rate (30%), liver failure rate (6.7%), readmission rate (6.1%), 30-day mortality rate (2.8%) and 90-day mortality rate (4.4%). Sarcopenia was associated with higher 30-day mortality (6.3% vs 0.9%, $p=0.05$), and sarcopenic obesity was further associated with pneumonia (9.7% vs 2.0%, $p=0.07$), bile leak (16.1% vs 6.0%, $p=0.05$) and liver failure (16.1% vs 4.7%, $p=0.02$). In patients over 65 years old, sarcopenic obesity was also associated with a higher 1-year all-cause mortality rate (21.4% vs 2.6%, $p=0.05$).

Conclusion: After controlling for tumor factors and case magnitude by limiting the patient cohort to only right hepatectomies, sarcopenic obesity was found to significantly impact post-hepatectomy outcomes, including longer-term survivals in elderly patients. Given that most patients have ample time for intervention during preoperative systemic therapy administration, sarcopenia should be assessed at diagnosis of liver metastases and remedied with nutritional and physical prehabilitation prior to surgery.

P7. ANGLE/DIAMETER RATIO: A SIMPLE RADIOGRAPHIC STAGING SYSTEM FOR ACHALASIA, AND OUTCOMES OF LAPAROSCOPIC HELLER MYOTOMY FOR ALL STAGES

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Background: Current classification of achalasia is based on manometry. The aim of the study was to identify a simple radiographic staging system for achalasia and to assess the outcomes of laparoscopic Heller myotomy with Dor fundoplication for all stages in a specialized center.

Methods: The staging system was designed based on right sided deviation of the esophageal axis and esophageal diameter (ED), defined as angle/diameter ratio (ADR) in (degrees/cm), calculated as: the angle between the distal right sided border of the esophageal wall above the gastroesophageal junction and a horizontal line at the level of gastroesophageal junction, divided by the maximum esophageal diameter on esophagram. The outcomes were measured by retrospective chart review, clinic visit and questionnaire via phone.

Results: From 02/2010 to 09/2015 there were 47 patients: 26 males and 21 females. Values are presented as median and interquartile range. Age: (35-59) years, maximum ED: 4.9 (3.3-6.0) cm, distal esophageal angle: 43.8 (30.5-60.7) degrees, ADR: 9.3 (17.3- 4.8) degrees/cm, range (51.3-1.3). As the disease advanced, ADR decreased. There were 4 stages I: ADR ≥ 30 , (n=5), II: 20 to <30 (n=5), III: 10 to <20 (n=10), IV: ADR <10 (n=27), Balloon dilation (BD) was performed in 24 (51%), Botox injections (BI) in 7 (15%) and both interventions in 5 (11%) prior to myotomy. The number of BD or BI per patient prior to myotomy was 1 (0-2). Linear regression analysis showed that with each one-unit decrease in ADR there was a decrease of 1.38 in the number of BI or BD per patient ($p < 0.02$). The use of PPI was less in stage IV: 13/27(48%), vs. stages I-III: 17/20(85%), ($p < 0.02$). The duration from onset of symptoms to referral for myotomy was 3.29 (1.45-12.44) years. The duration of diagnosis of achalasia to referral for myotomy was 7.3 (0.9 - 43.9) months. Myotomy was performed as the first intervention in 21/47 (45%). The duration of operation was 147 (116-191) min. There were no conversions and no leaks.

All had clear liquid diet in the recovery room and were discharged home on a full liquid diet. The median length of stay was 1 (1-2) day. There was no 30 day mortality. In- person clinic visit was obtained in 43/47(91%) at 0.7(0.4-7.7) months: 40/43(93%) were free of preoperative symptoms. A questionnaire via phone was obtained in 33/47 (70%). At 18 (9-49) months: 29/33 (88%) were free of preoperative symptoms and all were satisfied with the operation.

Conclusion: Angle/diameter ratio (ADR) identifies a simple radiographic staging system for achalasia and is a marker of the progression of the disease. The number of Balloon dilation or Botox injection decreased as the disease advanced and use of PPI was less in the stage IV. Myotomy is a simple and single intervention for the treatment of all stages of achalasia and can be achieved with no leak, short length of stay and excellent patient satisfaction in specialized centers.

P10. CENTRAL LYMPH NODE DISSECTION IMPROVES LYMPH NODE CLEARANCE IN PAPILLARY THYROID CANCER PATIENTS WITH LATERAL NECK METASTASES, EVEN AFTER PRIOR TOTAL THYROIDECTOMY

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Background: The management of level VI lymphatics in patients with lateral neck metastatic papillary thyroid cancer (PTC) remains controversial due to the lack of randomized controlled trials. The American Thyroid Association recommends a prophylactic central lymph node dissection (CLND) with total thyroidectomy (TT) in patients with lateral cervical metastases, but many patients present with lateral cervical metastases following TT. The purpose of this study was to determine the oncologic benefit of a bilateral CLND at the time of modified radical neck dissection (MRND) in patients with metastatic PTC who have previously undergone TT.

Methods: Retrospective, IRB approved, review of the Scott & White Tumor Registry was performed on all PTC patients who were treated for lateral cervical metastases from 2000-2015. Patients were divided into two treatment groups: the concurrent cohort underwent TT with CLND and MRND, and the interval cohort underwent CLND and MRND after prior TT. Primary outcomes were lymph node involvement, skip metastases, level VI cancer recurrence, permanent hypoparathyroidism and recurrent laryngeal nerve (RLN) injury.

Results: Eighty-two patients were identified for analysis. The concurrent treatment group consisted of 66 patients, including 11 patients who required a bilateral MRND. The interval group consisted of 16 patients, including 4 patients who required a bilateral MRND. Average time between TT and CLND was 4.7 years. Average follow-up time was 48.9 and 61.8 (p=0.32) in the two treatment groups. Clinically suspicious level VI lymph nodes were identified in 53% and 38% (p=0.28) of patients in the concurrent and interval groups, respectively. CLND removed more lymph nodes in the concurrent group than the interval group, 15.6 ± 8.3 to 10.1 ± 5.2 (p<0.01) and had more positive lymph nodes identified in the concurrent group compared to the interval group, 7.4 ± 7.4 and 3.5 ± 2.6 (p<0.01), respectively, but the percentage of positive lymph nodes to total lymph nodes examined was similar between the two groups (44.8% and 42.3%, p=0.78).

Contralateral level VI disease was present in 54.5% of the concurrent group and 50% of the interval group (p=0.78). The incidence of skip metastases was 9.0% and 6.3% (p=0.69) in the concurrent and interval treatment groups, respectively. Level VI recurrence occurred in 1 patient after concurrent CLND (1.2%). All permanent morbidities occurred after concurrent CLND: RLN injury, exclusive of two oncologically sacrificed nerves, in 1 patient (1.2%), hypoparathyroidism in 4 patients (4.9%).

Conclusion: The incidence of bilateral level VI lymph node metastases is high in PTC patients who present with lateral neck metastases. Bilateral CLND for PTC performed at the time of MRND for lateral neck metastases provides an oncologic benefit by improving lymph node clearance and minimizing level VI recurrence, even in patients who have undergone a prior TT.

P11. COMPLEX ABDOMINAL WALL HERNIA REPAIR WITH BIOLOGIC MESH: LONG-TERM OUTCOMES IN 176 PATIENTS

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Background: Complex abdominal wall hernia (CAWH) remains a major surgical problem. In the United States Acellular Dermal Matrix (ADM) mesh (human and porcine derived) has emerged as a popular choice for CAWH repairs, but long-term data are lacking. The aim of this study was to report the long-term results in patients undergoing CAWH repair using biologic mesh.

Methods: A 6-year retrospective analysis of all patients with CAWH who underwent ADM repair was performed. Patient demographics, operative technique, type of mesh used, co-morbidities, and hernia recurrence were analyzed. In addition, we calculated the relative risk of development of any complications, serious complications, surgical site infections, and pneumonia using the American College of Surgeons (ACS) Surgical Risk Calculator and compared to actual complications rate.

Results: Of the 176 patients included in the study, 142 (80.7%) had porcine and 34 (19.3%) human derived ADM mesh placement. One hundred and four (59.6%) were male; the mean age of the population was 53.6 ± 14.0 years. Mean BMI of the population was 31.1 ± 7.9 kg/m². 48.3% of patients required urgent/emergent operation; 22.9% for obstruction, and 14.2% had associated fistulas. The most common technique of mesh placement was an underlay (68.2%). Overall follow-up rate was 75.0% (mean: 16 months; range: 6-mo to 5-years) giving a recurrence rate of 18.8%. The wound complication rate was 29.5% of which 38.5% required hospital admission and/or surgery. Overall 21.6% patients required a reoperation and 9.1% patients underwent mesh explantation. The overall recurrence rate was higher in patients with porcine mesh repair (22.5% vs. 2.0%; $p=0.006$), however, there was no difference in rate of reoperation (24.8% vs. 8.8%; $p=0.06$), wound complications ($p=0.49$) or seroma ($p=0.99$) between the two groups.

Conclusion: Despite the advances in the management of patients with CAWR, the long-term outcomes for these patients following biologic mesh repair remain suboptimal. Patients undergoing CAWH repair with human derived ADM mesh had lower recurrence rate but no differences in other complications rates. Future long-term studies are required to determine the most appropriate biologic mesh type for abdominal hernias.

P12. AN OUTPATIENT LAPAROSCOPIC APPENDECTOMY PROTOCOL PRODUCES EXEMPLARY OUTCOMES AT A NATIONAL LEVEL

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Background: Quality of care can now be measured through metrics established by the National Surgical Quality Improvement Program (NSQIP). These metrics include return to operating room (ROR), readmission and surgical site infections (superficial, deep and organ space). An outpatient laparoscopic appendectomy protocol was initiated at our institution in 2010. It incorporates three important care practices that potentially impact these quality metrics: 1. Short interval from diagnosis to surgery; 2. Laparoscopic surgical approach; 3. Dismissal from recovery or day surgery for eligible patients. We sought to determine how our laparoscopic appendectomy protocol performed on a national level through analysis of NSQIP metrics.

Methods: Appendectomy was chosen as a targeted procedure for NSQIP in 2014. Therefore, all appendectomies performed at our institution after this date were subject to review by a NSQIP surgical clinical reviewer (SCR). All patients presenting with acute appendicitis were initially managed under the outpatient protocol. Patient were excluded for outpatient management if they had findings of perforated or gangrenous appendicitis at time of surgery. Our targeted appendectomy data was reviewed from July 2014 to June 2015 in the NSQIP Semi-Annual Report (SAR) and using our site-specific raw data. A separate, concurrent chart review of these patients was performed analyzing time from hospital presentation to surgery, time from CT scan to surgery, total time in facility for outpatient appendectomy, operative approach, American Association for the Surgery of Trauma (AAST) Disease Severity Score (DSS) for appendicitis, and 30 day success of outpatient management.

Results: 172 patients underwent appendectomy from July 1, 2014 to June 30, 2015. Patients undergoing interval appendectomies or other surgery were excluded (17 total). 155 patients with acute appendicitis were included for the final analysis. 152 patients (98%) had a CT scan as part of their diagnostic work-up. Median time from CT to surgery was 3.8 hours (IQR 2.8-5.3 hours). All patients had a laparoscopic approach and three patients (2%) were converted to an open procedure. Thirty-six (23%) patients had evidence of perforation or gangrene at the time of operation. 112 patients (71%) were dismissed from recovery or day surgery. Median time from admission to discharge for patients treated as an outpatient was 9.5 hours (IQR 7.3-11.2 hours). None of the patients had a surgical site infection or ROR per NSQIP criteria. Five (2.87%) patients were readmitted, yet only two patients had admission related to the surgery including UTI and PATOS (Present at Time of Surgery). Using the NSQIP SAR, we were in the 1st deciles for morbidity, SSI, and ROR. We were in the 2nd decile for readmission.

Conclusion: An outpatient laparoscopic appendectomy protocol produces quality parameters in the top deciles. Adoption of this approach should be considered as a best practice model.

P13. PREOPERATIVE THROMBOELASTOGRAPHY IDENTIFIES GREATER POSTOPERATIVE STROKE RISK IN THE OBESE DUE TO INCREASED PLATELET REACTIVITY: IMPLICATIONS FOR MANAGEMENT

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Background: Obesity has been associated with increased maximal amplitude (MA) in thromboelastography (TEG), a measure predominantly of platelet hyperactivity, and is a strong risk factor for thromboembolic complications after surgery. Our objective was to assess the relative contributions of preoperative coagulation and platelet factors with respect to postoperative thromboembolic complications in the obese.

Methods: TEG data was prospectively collected on all adult patients who underwent routine cardiovascular surgery at an academic medical center between October 2014 and August 2015. Patients were instructed to discontinue anticoagulants prior to surgery. Additional data including baseline demographics, coagulation profiles, and 30 day rates of thromboembolic events (TE) and mortality were recorded. Patients were categorized into three BMI groups (kg/m) as normal weight (BMI 18.5-24.9), overweight (BMI 25-29.9), and obese (BMI ≥ 30). 2-sided Cochran-Armitage Trend test was used to evaluate an ordered association between BMI and outcomes.

Results: A total of 384 patients met inclusion criteria. Median age was 67 (IQR 57-74), 71% were male, and median BMI was 26.2 (IQR 23.5-30.4). 26 (9%) experienced a TE. Incidence of VTE increased progressively with BMI [2.0%, 5.6%, 8.5%; $p=0.02$], as did stroke rate [0.7%, 1.6%, 5.7%; $p=0.01$], and mortality [0%, 0%, 4%; $p<0.01$]. Among all TEG parameters, BMI was significantly associated with CK-MA [63.5mm, 63.7mm, 65.6mm; $p=0.02$], and CK-MA ≥ 60 [75%, 79%, 86%; $p=0.03$], a direct marker of platelet reactivity. There was no association with either CK-R [4.7min, 4.9min, 4.9min; $p=0.43$], a marker of all coagulation factors' contributions to clot stability, or with platelet count (1K/UL) [108, 118, 130; $p=0.19$]. All strokes occurred in patients with CK-MA ≥ 60 . On multivariable analysis, CK-MA ≥ 60 ($p=0.011$) and obese state [aOR=9.06, 95%CI=1.48-174, $p=0.014$] remained independently associated with stroke but not venous thromboembolism ($p=0.51$).

Conclusion: Increased risk of postoperative stroke in obese patients may be due to increased platelet reactivity rather than hypercoagulability. Preoperative TEG CK-MA ≥ 60 identifies obese patients at higher risk for postoperative stroke. This suggests that the optimal postoperative thrombosis prophylaxis in this cohort should include antiplatelet therapy.

P14. NEOADJUVANT CHEMORADIATION INCREASES THE RISK OF DEEP ORGAN SPACE INFECTION AND READMISSION IN PATIENTS WITH RECTAL CANCER

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Background: Current evidence on the risk of postoperative complications following neoadjuvant therapy for rectal cancers is limited by small sample size. The objective of our study is to assess the impact of neoadjuvant therapy on 30-day mortality and post-operative complications in patients with rectal cancer.

Methods: We identified 13,090 patients with rectal cancer who underwent neoadjuvant chemoradiation preceding surgery (n=4,177) or surgery alone (n=8,913) using the ACS-NSQIP database (2005-2012). We analyzed the association between neoadjuvant therapy and 30-day postoperative outcomes in propensity score-matched cohorts.

Results: Among 7,604 propensity score-matched patients (neoadjuvant therapy, n=3,802; surgery alone, n=3,802), there was no difference in 30-day mortality (OR 0.939, 95% CI 0.574-1.536) between the groups. Similarly, there was no statistically significant difference in overall morbidity, pneumonia, unplanned re-intubation, ventilation >48 hours, deep vein thrombosis, pulmonary embolism, cardiac arrest, myocardial infarction, progressive renal insufficiency, acute renal failure, stroke, bleeding requiring transfusions, or return to the operating room between the two groups (all p-values >0.05). Although there was no statistically significant difference in superficial wound infections, deep wound infections, wound disruption, sepsis, or septic shock (all p-values >0.05), patients receiving neoadjuvant therapy were at higher risk for organ space infections (OR 1.237, 95% CI 1.020-1.502) and readmission (OR 2.157, 95% CI 1.385-3.360).

Conclusion: Within ACS-NSQIP hospitals, propensity score-matched patients with rectal cancer receiving neoadjuvant chemoradiation therapy are 1.2 times more likely to develop an organ space infection and 2.2 times more likely to be readmitted than patients not receiving neoadjuvant therapy.

P15. PERI-OPERATIVE BUNDLING AS A PRECURSOR TO ENHANCED RECOVERY PROTOCOLS IN ELECTIVE COLORECTAL SURGERY

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Background: This study is designed to evaluate improvement in surgical site infection (SSI) made by changes in peri-operative “bundling” (POB) surrounding elective colectomy from a systemic point of view, exclusive of newly developed enhanced recovery techniques (ERAS). Specifically, these incremental changes were designed to show that systemic change was possible prior to ERAS institution.

Methods: Peri-operative changes made included: the use of oral Neomycin and Metronidazole the evening prior to surgery, use of Ertapenem for peri-operative IV antibiotics, re-preparation of the wound prior to closure, use of Ticlosan impregnated suture for wound closure, single-stranded and buried absorbable fascial closure, use of dedicated wound-closure instrumentation, and replacement of non-adherent dressings with clear liquid skin sealants. A retrospective review was performed of all elective colectomies performed at our institution by a single surgeon from 2007-2015. Comparison was made between patients undergoing surgery before and after the use of POB. SSI's were defined according to CDC criteria. Demographic, physiologic, operative, and outcomes data were collected following IRB approval. Statistical analyses included Chi-Square, Independent T, and Logistic Regression tests with a significance level of .05.

Results: A total of 228 patients were included in the review, 160 pre-bundle and 68 post-bundle implementation. The cohorts were similar and 100% patient follow up was achieved. Rectal resections were included. There was no difference between groups in terms of age, gender, ASA Classification, Diagnosis, BMI, or co-morbid conditions.

Comparing operative variables, there was no difference in anatomical resection type, laparoscopic access rate, blood loss, or stoma creation before or after initiation of peri-operative bundling. All operations were performed by a single surgeon. The rate of surgical site infection decreased significantly with administration of our bundled methods (33.3% vs. 14.3%, $p = .015$). This was independent of access method, either laparoscopic or open ($p=.152$). Interestingly, the rate of SSI was not related in our cohort to blood loss ($p=.150$), the need for other procedures ($p=.245$), tobacco use ($p=.570$), or steroid administration ($p=.660$) among other common factors. Obesity was associated with increased risk of wound infection ($p>.001$), but administration of POB decreased infection rates among the obese from 35.2% to 16.7% ($p=.072$).

Conclusion: The use of peri-operative bundling has summatively reduced the rate of surgical site infection in patients undergoing elective colectomy. These techniques require only changes in surgical practice compared to the intensive multi-disciplinary care, and are a potential first step toward full enhanced recovery protocols.

P16. OVERALL BODY COMPOSITION AND SARCOPENIA ARE ASSOCIATED WITH POOR LIVER REGENERATION FOLLOWING PORTAL VEIN EMBOLIZATION

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Background: Recent studies suggest that sarcopenia (ratio of skeletal muscle volume to height) correlates with complications after hepatectomy. However, it is unclear whether this finding is explained by poor patient condition, impaired liver regeneration, or a combination of both. The objective of the study was to evaluate the relationship of body composition/sarcopenia with liver regeneration following portal vein embolization (PVE) for colorectal liver metastases (CLM).

Methods: To focus on a homogeneous cohort and eliminate confounding variables, 45 patients with CLM who underwent right PVE (segments 5-8) and had no prior history of hepatectomy were identified in a prospectively maintained database. Pre-PVE and post-PVE imaging was analyzed to determine liver volumes and to calculate degree of hypertrophy and the kinetic growth rate (KGR). To assess body composition, skeletal muscle area (cm²), subcutaneous adipose area (cm²), and visceral adipose area (cm²) were measured using advanced imaging software applied to the L3 level of the pre-PVE computed tomography scans. All areas were standardized to height (m²) and reported as skeletal muscle index (SMI), subcutaneous adipose index (SAI), visceral adipose index (VAI), and adipose index (AI = subcutaneous + visceral adipose). SMI, gender, and body mass index (BMI) were used to define sarcopenia, as previously published. Patient factors, including pre-PVE chemotherapy, and body composition measurements were compared to the future liver remnant (FLR) KGR using standard statistical techniques.

Results: The 45 study patients were equally divided into three KGR groups: lower third (KGR -7.2-0%), middle third (KGR 2.0-4.1%), and upper third (KGR 4.2-12.3%). Between these groups there was no difference in sex, BMI, diabetes, prior chemotherapy, albumin, SMI, SAI, AI, or pre-PVE liver volumes. Patients in the lower third KGR group did have a lower VAI (31.0 vs 53.0 vs 54.5, $P=.042$), a lower VAI/AI ratio (0.27 vs .47 vs .52, $P=.042$), and a higher SAI/AI ratio (.73 vs .53 vs .48, $P=.042$). Eighteen patients (40%) met the defined criteria for sarcopenia. Patients with sarcopenia did not differ from non-sarcopenic patients in age, BMI, diabetes, prior chemotherapy, albumin, SAI, AI, or pre-PVE liver volumes. Sarcopenic patients had a lower SMI (39.2 vs 56.8, $P<.001$), lower VAI (29.1 vs 57.4, $P=.004$), lower VAI/AI ratio (.26 vs .47, $P=.003$), and higher SAI/AI ratio (.74 vs .53, $P=.003$). Sarcopenia was associated with lower post-PVE FLR volume (36.5% vs 41.7%, $P=.007$) and lower KGR (8.3% vs. 15.2%, $P=.009$) with the rates of sarcopenia in the lower, middle, and upper third KGR groups of 60%, 40%, and 20%, respectively ($p=.082$).

Conclusion: Sarcopenia, along with low VAI and a low VAI/AI ratio are associated with impaired liver regenerative capacity, indicating that multiple components of body composition should be measured to predict liver-specific complications following hepatectomy for CLM.

P17. BENCHMARKING COMPREHENSIVE RECTAL CANCER CARE: INSTITUTIONAL COMPLIANCE WITH THE AMERICAN SOCIETY OF COLON & RECTAL SURGEONS (ASCRS) RECTAL CANCER SURGERY CHECKLIST

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Background: The American Society of Colon & Rectal Surgeons Rectal Cancer Checklist contains 25-items and comprises the essential elements of pre-, intra- and postoperative care that should be addressed during the surgical treatment of patients with rectal cancer. We examined historical compliance with checklist items in a mature multi-surgeon academic practice.

Methods: We conducted a retrospective review of all rectal cancer patients undergoing elective radical resection at our institution from Dec 2013 through Sep 2015 to determine completion of each item in the ASCRS Rectal Cancer Checklist. Using the median of completed checklist items, patients were either considered to be in a high or low checklist group. Statistical analysis was by chi-square analysis.

Results: During this period, 161 patients underwent elective rectal cancer resection, with a mean age of 58 years. Of the 161 patients, 105 underwent low anterior resection and 56 abdominoperineal resection. Items achieving 100% compliance included formal pathology review, complete colonic evaluation, clinical staging for metastases, en-bloc resection, description of type of reconstruction, postoperative stoma care, and postoperative referral to oncology. However, several areas of improvement were identified. No surgeon documented baseline sexual function, and only 16.8% of patients were formally discussed in a multidisciplinary setting. Among those receiving neoadjuvant therapy, clinical or radiographic re-staging was not documented in 37.1% of patients. Operatively, only 8.7% of dictations stated that the pelvic nerves were identified, and consideration for leak testing was only mentioned in 52.9% of cases.

Radial margin assessment was lacking in 42.5% of pathology reports. The median number of checklist items completed was 21 (IQR 20-23). Surgeons with less than 10 years of experience were more likely to be in the high checklist group than more experienced surgeons (65.6% vs 42.6%; $p=0.02$). Age, distance traveled, private insurance status and receipt of neo-adjuvant therapy within network were not significantly associated with higher checklist rates. Surgeons with less than 10 years of experience were more likely to repeat imaging post-neoadjuvant therapy (67.9% vs 29.4%, $p = 0.01$), discuss patients at tumor board (31.3% vs 13.2%, $p = 0.01$), and perform leak testing (86.7% vs 47.2%, $p = 0.002$).

Conclusion: We identified several areas for improvement in rectal cancer care within our own department, thus establishing a benchmark for future surgeon-directed interventions for elevating patient care. While patient factors did not impact checklist compliance, we found that less experienced surgeons had greater compliance in certain areas, particularly those that reinforce decision-making. Future efforts focused on improving checklist compliance in recognized problem areas may ensure uniform “best-practices” in the complex care of rectal cancer.

P18. DECREASED TRANSPORT TIME TO THE TRAUMA INTENSIVE CARE UNIT

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Background: Extended stay in the emergency department (ED) is associated with worse outcomes in critically ill trauma patients. A protected trauma intensive care unit (TICU) bed that is always available improves flow from ED to TICU and decreases ED length of stay (LOS). We conducted a human factors analysis to better understand impediments for trauma patient flow when a TICU bed is available in order to reduce ED LOS.

Methods: This is a retrospective review of all trauma patients admitted to a protected TICU through the ED during 2011 and 2014. In 2010, a 24-hour protected TICU bed protocol was implemented so that a bed was always available. During 2013 human factors were conducted to better understand flow disruptions and related interventions were introduced to facilitate more rapid transport from the ED to TICU. The interventions required the following prior to CT scanning: immediate ICU bed orders placed by the ED physician and ED to ICU personnel communication. Direct transport from the CT scanner to the ICU was mandated. Data including patient demographics, injury severity, ED LOS, ICU LOS, and hospital LOS were collected and compared between 2011 (PRE) and 2014 (POST).

Results: A total of 305 trauma patients directly admitted from the ED to the TICU were included for analysis; 174 patients in 2011 (PRE) and 131 in 2014 (POST). Average age was 46 years and patients had a mean admission GCS of 12.3 with an injury severity score (ISS) of 15.9. The two groups were similar in age, mechanism of injury, initial ED vitals (systolic blood pressure, heart rate, GCS), head/neck AIS, and injury severity. After implementing the human factors interventions, decreases were noted in the mean ED LOS (2.4 v. 3.0 hours, $p=0.005$) and ICU LOS (4.0 v. 4.8 days, $p=0.023$). No differences in hospital LOS or mortality were observed.

Conclusion: While an always open TICU bed protocol may facilitate rapid transport of trauma patients from the ED to the ICU, we demonstrate that additional human factors interventions emphasizing improved communication and coordination can further reduce time spent in the ED.

P20. IMPLEMENTATION OF A STANDARDIZED HANDOFF PROTOCOL FOR POST-OPERATIVE ADMISSIONS TO THE SURGICAL INTENSIVE CARE UNIT

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Background: The transfer of critically ill patients from the operating room (OR) directly to the surgical intensive care unit (SICU) involves handoffs between multiple care providers of various specialties. Incomplete handoffs lead to poor communication, which is a major contributor to sentinel events resulting in medical error and patient death. The aim of the study was to identify areas of improvement in the current method of patient handoffs at our institution, standardize the process, and determine whether this led to improvements in caregiver involvement and information omissions.

Methods: A prospective intervention study was designed to observe the process surrounding patient transfer from OR to SICU at Scott & White Memorial hospital, a 635 bed tertiary care academic center in a semi-rural setting. Thirty one patient handoffs from the OR to SICU were observed for 49 critical parameters including caregiver presence, pre-operative and intra-operative details, and time required to complete key steps. Over the intervening six months, a standardized protocol was implemented and all caregiver groups educated regarding the new protocol. Thirty one follow-up handoffs were then observed to determine whether there was an improvement in caregiver involvement and information omission.

Results: Standardization led to a significant improvement in presence of an ICU physician provider as well as a member of the surgical team during the bedside handoff and transfer ($p=0.0004$ and $p<0.0001$, respectively). Resultantly, there was an overall improvement in information omissions in both the surgical report, e.g. identification of the procedure performed ($p=0.0048$), complications ($p<0.0001$), and concerns ($p<0.0001$), and the anesthesia report, including easy of laryngoscopy ($p<0.0001$), ventilator settings ($p<0.0001$) and pressor requirements ($p=0.0134$).

Protocolization also led to an average decrease in time required for physical transfer to the ICU monitor by 27 seconds ($p=0.11$) and the ventilator by 12 seconds ($p=0.58$) while only increasing time required for handoff from 5:37 to 6:16 ($p=0.22$), which was not statistically significant.

Conclusion: Implementation of a standardized handoff protocol when transferring patients from the OR to the SICU led to a significant improvement in caregiver involvement and reduction in information omission without a drastic increase in time commitment of involved providers.

P22. PEDIATRIC BLUNT ABDOMINAL AORTIC INJURY (BAI)

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Background: Pediatric traumatic blunt abdominal aortic injury (BAI) is rare, but dangerous, presenting a management conundrum for surgeons. Data regarding the epidemiology, contemporary management, and outcomes of these injuries are scarce. We reviewed national epidemiologic data and management trends as well as our institutional cohort.

Methods: A review of the National Trauma Data Bank (NTDB) for patients aged <18 years from 2007-2012 was performed. International classification of diseases and procedure codes were used to identify BAI and therapy type. A concurrent single-center, retrospective review of patients aged <18 years with BAI from Oct 2004-May 2015 was also performed. Descriptive statistics of the median and interquartile range (IQR) and frequencies and percentages were utilized, with linear regression to evaluate trends.

Results: NTDB review included 564,593 patients with 261 aortic injuries, 57 of which were BAIs yielding an incidence of 0.01%. The median age was 15 (IQR 12, 16) and 38 (67%) were male. Open repair was performed in 12 patients (21%) vs. endovascular therapy in five (9%) vs. non-operative treatment in 40 (70%). There was an overall mortality of 14% with a non-significant trend towards reduced mortality over time ($p=0.28$). Our institutional review identified five patients with BAI associated with lap belt use in a motor-vehicle collision. The median age was 12.6 (11, 13), three were males (60%) and the median injury severity score was 42.4 (34, 43). All had associated lap belt use and suffered injuries immediately above the aortic bifurcation diagnosed with computed tomography imaging. Four (80%) patients had associated vertebral fractures. One patient with a grade III BAI was managed conservatively with anti-impulse therapy and aspirin with spontaneous resolution at 4 months. However, another patient with a grade III BAI developed circumferential aortic dissection with associated stenosis and reduction in ankle-brachial index. He is planned for open repair given the risk of aortic occlusion. One patient with a grade II BAI underwent aortic endarterectomy with bovine patch for the development of an intimal flap after initial conservative management. Another patient with a grade III BAI underwent initial heparin therapy and endovascular aortic repair with a Gore® Excluder® device (16x14.5x7cm) for an enlarging pseudoaneurysm. The last patient had a grade II BAI developed an enlarging right common iliac artery aneurysm and underwent an open repair with hypogastric artery. All repairs have remained patent with no mortalities. Median hospital stay was 25 days (10, 44) with an ICU stay of 8.4 days (5, 12). Median follow-up was 330 days (185, 416).

Conclusion: Pediatric abdominal BAI is associated with a 14% in-hospital mortality. No uniformly accepted management algorithm currently exists, though not all injuries mandate urgent therapy. Further multicenter prospective studies are needed to clarify the natural history and operative indications for pediatric BAI.

P24. A TWO WEEK DEDICATED GENERAL SKILLS SURGICAL SIMULATION CURRICULUM RESULTS IN SIGNIFICANT IMPROVEMENT IN SURGICAL SKILLS

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Background: Simulation is an evolving field in surgical education. Most residency programs have not adopted dedicated time to a surgical simulation curriculum. The aim of this study was to determine whether a dedicated surgical skills simulation curriculum would result in improvement in technical skills and confidence.

Methods: Beginning in 2014, general surgery residents (PGY2-PGY3) rotating through the Division of Surgery completed 10 modules in the simulation laboratory that included general laparoscopic, open, and endoscopic skills. Over the course of two weeks, the training program was composed of a pre-training test, mentored instruction, practice, and post-training testing. Both pre- and post-training tests were videotaped and scored by the resident and evaluator using validated assessment tools. An expert surgeon served as the evaluator and was not blinded to pre- or post-training. Paired t-test and Wilcoxon signed-rank test assessed differences pre- and post-training, and intraclass correlation coefficient (ICC) was used to evaluate resident-evaluator agreement.

Results: Eleven residents participated in the surgical simulation curriculum (nine PGY2, two PGY3). Evaluators rated residents as improving significantly pre- to post-training on all ten tasks ($p < 0.01$ for all). Residents self-evaluated themselves as improving significantly on all ten tasks ($p < 0.01$ for all). Pre-training test scores showed moderate to strong reliability between residents and evaluators on all but one task ($ICC > 0.6$ for all but intraoperative Ultrasound [US] ($ICC = 0.22$)). Post-training test scores showed moderate to strong correlation between residents and evaluators on all but one task ($ICC = 0.50-0.93$ for all but intraoperative US ($ICC = 0.02$, $p = 0.94$)). Confidence significantly improved in all tasks from pre- to post-training. After completion of the curriculum, residents reported higher comfort levels in performing the tasks.

Conclusion: A dedicated simulation curriculum results in technical skill improvement and increased confidence and comfort in performing general surgical skills.

P25. ELDERLY TRAUMA PATIENTS CAN SAFELY BE ADMITTED TO NON-INTENSIVE CARE HOSPITAL UNITS

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Background: Trauma centers across the United States are caring for elderly trauma patients with greater frequency every year. Previous literature showed improved outcomes in this population from aggressive care and invasive monitoring. This may have led to an increased utilization of intensive care (ICU) resources for these patients. However, no previous studies have compared outcomes based on admitting unit acuity. The goal of our study is to assess the safety of admitting these patients to non- intensive care units.

Methods: Retrospective data was acquired from our trauma registry of elderly (≥ 65 years old) trauma patients admitted to our urban level I trauma center from 2006 to 2015. After excluding patients who were deemed to have injuries that were terminal and irreversible at presentation and were admitted for comfort measures only, we compared demographic data and outcomes between patients admitted to the ICU and surgical ward. Mortality was our primary endpoint and transfer to a higher level of care from the surgical ward was our secondary endpoint. Approval for our study was obtained from our Institutional Review Board.

Results: 3,682 elderly trauma patients met our inclusion criteria. 1,838 (50%) were admitted to the ICU and 1,844 (50%) to the surgical ward. When comparing patients admitted to the ICU vs. surgical ward there were significant differences in admission systolic blood pressure (146 vs. 149, $p=0.0002$), pulse (85 vs. 81, $p < 0.001$), GCS (14 vs. 15, $p < 0.001$) and ISS (16 vs. 8, $p < 0.001$). Mortality among patients admitted to the ICU was 7% ($n = 135$), and was much lower for patients admitted to the surgical ward (0.82%, $n = 15$, $p < 0.001$). Less than 1% of patients admitted to the surgical ward required transfer to higher level of care ($n=8$, $p < 0.0001$). A subgroup analysis of patients with all system AIS scores < 3 , no hypotension on admission, and $GCS \geq 14$ was also performed, which included 766 (72%) admitted to the surgical ward and 300 (28%) admitted to the ICU. Patients admitted to the ICU were older (77 vs. 76 years old, $p=0.003$), more likely to be male gender (54% vs. 45%, $p=0.007$), more tachycardic (HR 84 vs. 81, $p=0.004$), and more severely injured (ISS 5 vs. 4, $p < 0.0001$). Only two patients (0.26%) admitted to the ward died ($p=0.0009$) and none required transfer to a higher level of care ($p < 0.0001$).

Conclusion: When appropriately triaged, elderly trauma patients can be selectively admitted to non-intensive care wards with acceptable outcomes. This selective utilization should result in cost savings as well as reserve ICU resources for the most severely injured patients.

P26. CLINICAL EFFECT OF ENOXAPARIN ON INTERNATIONAL NORMALIZED RATIO AFTER PARTIAL HEPATECTOMY

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Background: Enoxaparin inactivates factor Xa via a complex formed after binding to circulating anti-thrombin III. This mechanism is reported to not alter hemostatic measures such as clotting time, PT or PTT. To date, no clinical trials have shown a causal relationship between the clinical/pharmacological effects of enoxaparin on INR. The aim of our study is to show the clinical effect of enoxaparin on International Normalized Ratio (INR).

Methods: One hundred and sixty cases were reviewed from an IRB approved prospective database of patients undergoing partial hepatic resection for malignancy. Patients were stratified based on dose of enoxaparin received. INR levels were recorded for 6 days: pre-operative to 5 days after surgery. From the calculated standard deviation values, we made the assumption that the effect observed was due solely to enoxaparin. To determine the direct effect, we divided the mean INR by the standard error (Mean/STE). The direct effect measures the extent to which the dependent variable changes when the independent variable increases by one unit and the mediator variable remains unaltered.

Results: Median preoperative INR was 1.0 in both the 30mg (N = 29) and 40mg (N= 131) groups, and trended to a maximum of 1.40 in both groups by postoperative day 3 (p=0.001). By postoperative day 5 the median INR fell to 1.20 in both groups. In both groups, median hemoglobin levels were significantly lower from baseline (12.3 and 12.1) to each post-operative day 1-5, but values were not significantly different between groups. Median bilirubin, creatinine and platelet counts were not different between groups. No patient had a clinically significant post-operative bleeding while on enoxaparin. Enoxaparin demonstrated a direct effect (Mean/STE) on INR, with a maximum effect noted on post-operative day 3. This effect was similar for both 30mg and 40mg groups.

Conclusion: This is the first clinical evidence of the effect of enoxaparin on INR in patients undergoing hepatic resection. We demonstrate an increase in INR for patients who received enoxaparin for post-operative VTE prophylaxis. Although no clinically significant bleeding were noted, INR levels should be monitored post liver resection for those on enoxaparin. Future studies will be necessary to evaluate if these increases in INR are clinically relevant or related to lab abnormalities.

P27. AGE IS NOT AN INDEPENDENT RISK FACTOR FOR MAJOR HEPATOBIILIARY AND PANCREATIC CANCER SURGERY

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Background: While surgery can be curative following a diagnosis of early stage cancer, surgeons are often hesitant to offer a major operation to elderly patients due to potential increased risks of post-operative complications and death. Previous studies in esophageal and colorectal cancer have shown that increasing age, when stratified by pre-operative comorbidity, is not a predictor of worse clinical outcome. The risk of advancing age in patients undergoing complex surgical resection for hepatobiliary and pancreatic (HPB) malignancy remains unclear. The purpose of this study is to evaluate the effects of increased age on post-operative morbidity and mortality in a modern series.

Methods: We performed a retrospective cohort analysis from our state tumor registry of patients 18 years and older with a history of HPB malignancy who had undergone major surgery for pancreas, liver, gallbladder, or bile duct cancer from 2000-2012. The cohort was divided into age subgroups of 18-64, 65-71 and >71 years and stratified by the Charlson Comorbidity Index (CCI). Age group, sex, and CCI were compared individually against discharge location, presence of post-operative complications, and 30-day mortality rate. Primary outcome measures included place of discharge, hospital length of stay, 30-day mortality, overall survival, and complication rate.

Results: We identified 1139 patients diagnosed with HPB malignancy during the study period. Of these patients, 286 underwent surgery as part of their cancer-directed therapy. Fifty-six patients were excluded from analysis secondary to incomplete clinical data. A total of 149 males and 79 females were included in our final cohort. Age at diagnosis ranged from 26-88 years, with a mean age of 61. Of patients ≥ 65 years, 14.8% were discharged to a skilled nursing facility as compared to 6.7% in the < 65 y group; however this did not reach statistical significance ($p=0.06$). There was no significant difference in hospital length of stay, 30-day mortality, or overall survival between the age groups. Surprisingly, when comparing complication rates of patients aged 65-71 to those >71 years, the younger group had a higher complication rate of 65% versus 39% ($p=0.01$). Sex and CCI were not significant predictors of any outcome measures.

Conclusion: Increasing age is not a risk factor for post-operative morbidity or mortality in patients undergoing surgery for HPB malignancies when stratified by pre-operative comorbidity. Patients aged 65 years and older may be discharged more often to a skilled nursing facility after HPB surgery compared to younger patients, though further study is required to confirm the observed trend.

P30. HOW “CLEAN” IS THE OPERATIVE ROOM: QUANTIFYING STAPHYLOCOCCUS AUREUS DENSITIES ON SURGICAL LIGHT SYSTEMS

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Background: Operative complications such as surgical site infections are increasingly heavily tracked metrics and are multifactorial in their development. One potential factor may involve environmental surfaces, including surgical light systems that are capable of collecting pathogenic contaminants such as blood, dust and free microbes. Due to the position of the lights relative to the operating room ventilation system, these particles may enter the sterile field and surgical site when the lights are perturbed during surgery. However, no study to date has evaluated the infectious potential of the material on the lights' upper surfaces. As *Staphylococcus aureus* (SA) is the leading cause of surgical site infections, its presence on operating room surfaces can serve as a relevant marker of surface contamination.

Methods: Using Baird-Parker agar contact plates, 25 operating rooms in a major academic medical center were sampled over the course of one week to quantify the density of viable SA on operating room surfaces. The upper surfaces of the surgical lights were sampled with 45 randomly distributed contact plates. Three comparison samples were taken from 15 of the operating rooms selected at random. These sites were: the illuminated glass surface of the lights, the operating table, and the floor. After incubating the samples, SA colonies were presumptively identified based on their unique morphology on the medium, and densities were measured in colony forming units per square meter (CFUs/m²).

Results: There were 17 of the 45 samples from the upper lights that grew SA colonies, while only 5 of the 45 comparison samples grew SA colonies. The mean density of SA on the upper surface of the surgical lights was found to be 267 ± 63 CFUs/m², while the mean density of SA on other surfaces sampled was found to be 55 ± 25 CFUs/m². Thus, the upper surfaces of the surgical lights were estimated to have 4.9 ± 2.5 times the density of viable SA compared to the average of the other surfaces ($P=0.003$).

Conclusion: Given that SA is the leading cause of surgical site infections, these results suggest that the upper surfaces of surgical light systems may be a potential source of intraoperative contamination.

P31. TOTAL LAPAROSCOPIC VERSUS OPEN PANCREATODUODENECTOMY: A PROPENSITY SCORE MATCHED ANALYSIS

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Background: Meaningful studies comparing the postoperative outcomes of total laparoscopic (TLPD) to that of open pancreatoduodenectomy (OPD) are lacking. Differences in baseline/pre-surgical patient characteristics between TLPD cohorts and OPD cohorts may exist, leading to differences in risk factors and therefore differences in post-operative complication rates. Our aim was to compare the outcomes of TLPD and OPD approaches while propensity matching for baseline/pre-surgical patient characteristics and controlling for intraoperative known risk factors for PD postoperative morbidity.

Methods: Patients undergoing pancreatoduodenectomy from 2007 to 2015 were evaluated. TLPD patients were propensity score matched to OPD based on age, BMI, gender, year of operation, diagnosis risk group and vein resection status. Univariate and multivariable analysis were performed. Multivariable analysis controlled for operative time, gland texture, duct size, estimated blood loss (EBL), and procedure type.

Results: 336 TLPD patients were identified and propensity score matched to 336 OPD. Despite propensity score matching for known pre-surgical variables, the TLPD cohort had a significantly greater proportion of soft glands ($p=0.001$) and smaller pancreatic duct size ($p<0.001$). There was no difference in operative time, readmission rate, any or clinically significant (CS) postoperative pancreatic fistula (POPF), post-pancreatectomy hemorrhage (PPH), total parenteral nutrition (TPN) utilization, or interventional radiology (IR) procedures. TLPD had less EBL(<400cc: 69.3% vs 33.3%; >1000: 6.5% vs 24.7%; $p<0.001$), shorter length of stay (LOS) (median 7.0 vs 9.0 days; $p<0.001$) and less rate of any delayed gastric emptying (DGE) (19.6% vs 33.3%; $p=0.001$) and CS-DGE (13.4% vs 19.6%; $p=0.048$). Thirty-day mortality following TLPD was 1.2% and was not different from the OPD group 0.9% ($p=1$). TLPD was independently associated with decreased odds of Any-POPF (OR=0.644, 95th CI: 0.417-0.922, $p=0.046$), CS-DGE (OR=0.588, 95th CI: 0.360- 0.960, $p=0.0336$) and Any-IR procedure (OR=0.61, 95th CI: 0.399-0.934, 0.023). TLPD was not independently associated CS-POPF, percutaneous drain placement, PPH, prolonged LOS (>14 days) or readmission. Small duct size and/or soft gland texture were independently associated with Any-POPF, CS-POPF, percutaneous drain placement, and Any-IR procedure.

Conclusion: This study suggests that TLPD is non-inferior and provides several advantages over OPD. When compared to a cohort of propensity matched patients, TLPD provides similar outcomes to OPD with regard to CS-POPF, percutaneous drain utilization, readmission and mortality. After controlling for known intra-operative risk factors; TLPD is independently associated with decreased odds of Any-POPF, CS-DGE, and Any-IR Procedure. TLPD also results in decreased EBL and median hospital stay. Ongoing investigation and application of minimally invasive pancreatoduodenectomy is warranted.

P32. TRAUMA CENTER TRIAGE AND MORTALITY IN ELDERLY EMERGENCY GENERAL SURGERY PATIENTS

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Background: Age is a known risk factor for morbidity and mortality in emergency general surgery (EGS), and mortality in EGS differs with trauma center (TC) level of designation. Undertriage is a known occurrence in elderly trauma patients; however the impact of care at a TC versus a non-trauma center (NTC) in elderly EGS patients is unknown. We hypothesized that undertriage of elderly EGS patients would be demonstrated as a survival benefit for patients treated at TCs.

Methods: A review was performed from 2009-2013 of the Maryland Health Services Cost Review Commission (HSCRC) database. Individual EGS ICD-9 codes were grouped into 22 EGS diagnosis categories as previously described. We compared elderly (age 65 and older) to younger adults, and compared TC to NTC.

Results: Of 882,845 total EGS encounters, 367,880 (41.67%) occurred in elderly patients, with 287,205 (78.07%) elderly patients seen at a NTC and 80,675 (21.93%) at a TC. Elderly patients at NTCs more commonly had ED admission, less extreme risk of mortality (ROM), and less extreme severity of illness (SOI) ($p < 0.001$ for all) when compared with TCs. In elderly patients NTC care was more frequent (16/22, $p < 0.03$) or similar (5/22) in all categories but appendix ($p < 0.001$). Controlling for SOI and age, individual regression analyses were performed for each diagnosis category, with lower risk of mortality for elderly patients at NTCs in 11/22 diagnoses categories ($p < 0.02$ for all), higher risk of mortality in 1/22 diagnosis categories (vascular, $p = 0.003$), and similar mortality risk in 9/22 diagnosis categories. Concurrent increased NTC utilization and lower NTC mortality for elderly patients occurred for 9/22 diagnosis categories (biliary, cardiothoracic, colorectal, gastrointestinal bleeding, hepatic, intestinal obstruction, resuscitation, soft tissue, and tracheostomy), with these diagnosis categories comprising 221,370 of 287,205 total EGS diagnoses occurrences (77.08%).

Conclusion: A majority of elderly EGS patient diagnoses occur in disease categories where care is more frequent at NTCs and is associated with a lower mortality at NTCs. Only the vascular category was associated with a higher mortality in elderly patients at NTCs. Undertriage of elderly EGS patients does not seem to significantly exist as it does in trauma.

P33. SURGICAL OUTCOMES FOLLOWING CHEMOTHERAPY FOR LOCALLY ADVANCED OR NODE POSITIVE GALLBLADDER CANCER

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Background: In patients with locally advanced or otherwise high-risk malignancy, preoperative chemotherapy is a valuable strategy for conversion to resection and/or assessing disease biology prior to operation. However, the utility of such an approach in patients with gallbladder carcinoma (GBCA) is unknown. This study evaluates outcome of GBCA patients treated with preoperative chemotherapy for locally advanced or lymph node involved tumors in the absence of distant metastases.

Methods: Patients receiving systemic chemotherapy based on imaging, biopsy, or previous exploration for locally advanced (biliary and/or vascular involvement) or lymph node positive GBCA were identified from a prospectively maintained surgical database. Patients were excluded if there was any evidence of distant metastatic disease or if the records were inadequate to determine type and duration of chemotherapy prior to response assessment. Initial response to chemotherapy (RECIST), results of subsequent surgery, definitive resection rate, outcomes and survival were assessed.

Results: Between 1995 and 2015, 74 patients met criteria for inclusion in the study with appropriate chemotherapy records for review. 89% of patients (n=64) were treated with gemcitabine-based regimens and 57% with combination gemcitabine/platinum (n=42). At the initial response assessment, 17 patients (23%) had progression with the remaining 57 patients (77%) having stable disease (n=38, 51%) or a partial response (n=19, 26%). In total, 22 patients (30%) with stable or partial response to chemotherapy underwent an attempt at definitive resection. At operation, 10 patients (14%) had definitive resection, but 12 patients (16%) were unresectable due to peritoneal involvement (n=4), discontinuous liver metastases (n=1), locally unresectable (n=4), or disseminated nodal disease beyond scope of resection (n=3). There were no statistically significant differences between patients with definitive and non-definitive resections with regard to type of chemotherapy, previous exploration, or pre-treatment stage (p>0.05). OS for the entire cohort was 14 months (95% CI 11.3-17.9). In patients that went to surgery, definitive resection was associated with a median OS of 51 months (95% CI 11.7-55.3) compared to 11 months (95% CI 4.1-23.6) for those that were unresectable (p=0.003).

Conclusion: Even in the absence of distant metastatic disease, locally advanced or lymph node positive GBCA is associated with poor survival. Definitive resection was possible in a subset of patients selected for surgery after a favorable response to chemotherapy and was associated with long-term survival. This data supports surgical re-evaluation following chemotherapy for locally advanced gallbladder cancer to select potential operative candidates. Neoadjuvant chemotherapy for locally advanced or node positive gallbladder cancer should be evaluated in prospective trials.

P34. A CONTEMPORARY ANALYSIS OF SURVIVAL FOR RESECTED AMPULLARY CARCINOMA

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Background: Ampullary cancer accounts for 6.8-20% of all periampullary tumors. The purpose of this study was to determine prognostic factors affecting outcomes of this cancer among a cohort of surgical patients.

Methods: This was an IRB approved retrospective review of a prospectively maintained database of patients operated on for ampullary carcinoma from 1997-2014 at Northwestern University and NorthShore University hospitals. Regression analyses were performed on clinical and pathologic data to determine significant predictors of recurrence and mortality.

Results: A total of 104 patients were included in the study: 52 (50%) were female; mean age of all patients was 64.2 and 90 (86.5%) were Caucasian. Eighty-one patients (77.9%) had a biliary stent placed prior to surgery. Tumor characteristics are as follows: T0/Tis 4 (3.9%), T1 10 (9.6%), T2 32 (30.8%), T3 39 (37.5%), T4 19 (18.3%); N0 51 (49.0%), N1 53 (51.0%). There was lymphovascular invasion in 49 (49.5%) and perineural invasion in 31 (57.4%) patients. The median number of positive nodes was 2 and the median LN ratio was 0.13. There was a positive margin in 4 (3.8%) patients. Eighteen patients (34%) had a LN ratio >20%. Pathologic data with IHC staining was gathered for 61 patients; 20 (31.8%) had intestinal type, 37 (58.7) had biliary type, and 4 (6.4) had mixed tumors. Median follow-up was 39 months and 57 (55.9%) patients died during follow-up. The 5- year disease-free survival rate was 37.6% and the 5-year overall survival rate was 49.9%. Factors that were significant predictors of recurrence included tumor size > 20mm (p=0.025, HR= 2.16), positive node status (p=0.045, HR=1.88), perineural invasion (p=0.05, HR=2.53), and positive margin (p=0.01, HR=4.72). Factors that were significant predictors of mortality included tumor size >20mm (p=0.004, HR=1.31), positive node status (p=0.032, HR=1.80), positive margin (p=0.011, HR=1.37), and major vessel involvement (p=0.03, HR=3.20).

Conclusion: In this cohort of recent patients with ampullary cancers treated by surgical resection, the predominant determinants of disease-free survival and overall-survival included biologic and pathologic factors reflecting the extent of local and regional disease. The effectiveness of surgical intervention was driven by the ability to achieve a complete margin-negative extirpation of localized disease whenever possible. These findings may help guide adjuvant treatment recommendations for patients with poor prognostic factors as delineated in this series.

P36. BOTULINUM TOXIN PYLOROPLASTY REDUCES DELAYED GASTRIC EMPTYING FOLLOWING PYLORUS-PRESERVING PANCREATICODUODENECTOMY

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Background: Delayed gastric emptying (DGE) is a common postoperative complication following pylorus preserving pancreaticoduodenectomy (PPPD); published incidence between 30%-50%. The etiology of DGE is likely related to a disruption of the neural-hormonal pathways affected by disruption of vagal innervation and loss of motilin secretion resulting in physical pyloric spasm. We hypothesized that chemical pyloroplasty using Botulinum Toxin (BTX) injection at time of PPPD may decrease the incidence of postoperative of DGE.

Methods: A retrospective review of consecutive series of patients undergoing PPPD with chemical pyloroplasty utilizing 100 units BTX injected into pyloric valve at time of surgery was analyzed from July 2013 to May 2016. Patients who underwent standard PD or who did not receive BTX injection for any reason were not included. Perioperative course and development of DGE was assessed using the International Study Group of Pancreatic Surgery (ISGPS) definition. Primary and secondary DGE were assessed.

Results: Twenty five patients met inclusion criteria for analysis that underwent PPPD with BTX: median age 67 range 46 to 77. During this same time frame approximately 50% of patients underwent standard PD or did not receive BXT; cases not included in this review. Postoperative complications included: pancreatic leak (n= 3), pneumonia (n= 1), intra-abdominal abscess (n= 1), atrial fibrillation (n= 2) and pulmonary embolus (n=1). Primary DGE occurred in 2 patient (8%) both Grade A. Secondary DGE occurred in 2 patients (8%) both Grade A. In patients with secondary DGE, all were made NPO (iatrogenic) in order to manage postoperative complications. For the entire group, median time to tolerate regular diet was 5 range: 3 to 13. Postoperative length of stay was 8 range: 4 to 17. We did not identify any BTX related complications or adverse reactions.

Conclusion: Chemical pyloroplasty is a safe and effective method to minimize the incidence of primary DGE following PPPD. Utilizing this technique in over twenty-five consecutive cases we have decreased the incidence of primary DGE to 8%.

Secondary DGE attributed to common complications of the PPPD procedure are not likely to be altered with this technique. Further study is needed to see if this technique is cost effective in shortening hospital stay and decreasing postoperative needs for J tubes and TPN.

P38. IMPACT OF ANASTOMOTIC LEAKS ON LONG-TERM ONCOLOGICAL OUTCOMES IN PATIENTS WITH RECTAL CANCER

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Background: To study the impact of anastomotic leaks on long-term oncological outcomes in patients with rectal cancer who underwent sphincter preserving surgery.

Methods: Our high volume institutional prospectively maintained database was retrospectively reviewed. All consecutive adult patients with rectal adenocarcinoma undergoing curative intent surgery with sphincter preservation from January 2000 through December 2013 were included. Patients with stage IV or recurrent disease were excluded. Clinical characteristics and oncological outcomes were compared between patients who developed anastomotic leak (AL) and those without leak (NAL). Kaplan- Meier survival estimates curves were used to compare overall and stage specific survival between the two groups.

Results: A total of 787 (260 female) patients with mean (SD) age of 58 (13) years met inclusion criteria. Anastomotic leak was noted in 41 patients (5.2%) with mean (SD) follow up of 64.6 (45.4) months. Patient demographics, follow up, tumor location, stage of cancer, type of anastomosis, surgical technique, utilization of diverting stoma and use of chemotherapy were statistically comparable between the two groups. There was no difference in incidence of distant metastasis (6 [14.6%] vs. 90 [12.1%] patients, $p=0.62$) or locoregional recurrence (2 [4.9%] vs. 14 [1.9%] patients, $p=0.20$) between patient with AL and those without NAL. Median length of stay was greater in the AL group compared to NAL group (9 vs. 5 days, $p<0.001$). There was no difference in overall and stage-specific survival.

Conclusion: Anastomotic leak did not demonstrate any statistically significant long-term adverse effect on cancer recurrence, overall, and stage-specific survival.

P39. SPINAL CORD INJURY AND BRADYCARDIA: INCIDENCE AND PREDICTORS OF INVASIVE CARDIAC PACING

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Background: Bradycardia is a well-known side effect of high spinal cord injury (SCI), however the incidence of severe bradycardia refractory to medical management requiring invasive cardiac pacing is unknown. The factors associated with the need for cardiac pacing are also not well characterized. This study aims to determine the proportion of SCI patients that require pacemakers, identify factors associated with invasive cardiac pacing, and characterize the effect of pacemaker dependency on mortality.

Methods: This was a retrospective review utilizing the Nationwide Inpatient Sample (NIS) Database from 1998-2012. Patients with cervical and thoracic SCI those who required pacemaker placement or transvenous pacing were identified by ICD-9 code. Baseline demographics such as race, age, insurance status, Charlson comorbidity index (CCI) and comorbid conditions were also examined. Univariate and multivariate logistic regressions were used to identify factors associated with pacemaker placement and mortality in SCI patients.

Results: 27,996 patients with SCI were identified. There were 15,633 (55.8%) patients with cervical SCI and 12,363 (44.2%) of patients with thoracic SCI. Of these, 234 (0.8%) patients required invasive pacing. On multivariate logistic regression predictors for invasive cardiac pacing included Black race (OR 1.5 CI 1.0-2.3, $p=0.040$), age 35-50 and 50-65 compared to those 18-35 (OR 1.9 CI 1.1-3.2, $p=0.015$ & OR 2, CI 1.2-3.3, $p=0.010$ respectively), arrhythmias (OR 25, CI 16.7-37.3, $p<0.001$) and presence of congestive heart failure (OR 2.7, CI 1.6-4.6, $p<0.001$). Overall the in-hospital mortality rate was 10.4%. Invasive pacing was associated with a lower risk of death (OR 0.60, CI 0.39-0.91 $p=0.016$).

Conclusion: In the largest study to date, rates of invasive pacing in SCI are low but are more likely to be associated with arrhythmias, congestive heart failure, older age and African American race. Pacer placement was also associated with a lower risk of death.

P40. PRE-OPERATIVE HYPERBILIRUBINEMIA AND EARLY POST-OPERATIVE MORBIDITY AND MORTALITY FOLLOWING CHOLECYSTECTOMY: AN ANALYSIS OF THE NATIONAL SURGICAL QUALITY IMPROVEMENT PROGRAM

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Background: Obstructive jaundice can cause endotoxemia, immunosuppression, and hepatorenal dysfunction, which results in a systemic pro-inflammatory state. It is common for patients with conditions resulting in elevated total bilirubin levels to undergo general surgical procedures. Cholecystectomy is one of the most common general surgical procedures. This study was designed to evaluate early post-operative morbidity and mortality following cholecystectomy in patients with pre-operative hyperbilirubinemia.

Methods: This was a retrospective analysis of the American College of Surgeons National Surgical Quality Improvement Program database. All cholecystectomies recorded in the database from 2005 to 2014 were included. Standard multivariate regression analysis was applied to determine an association between elevated pre-operative total bilirubin (T-bili), defined as >1.0 gm/dL on the day of operation, operative time, and 30-day post-operative morbidity and mortality.

Results: Patients with pre-operative hyperbilirubinemia on the day of operation accounted for 20,452 of 62,167 patients who underwent open or laparoscopic cholecystectomy with or without intra-operative cholangiography.

Pre-operative risk factors included diabetes, current smoking, dyspnea, history of COPD, ascites, CHF within 30 days before surgery, hypertension requiring medications, disseminated cancer, presence of open wound or wound infection, $>10\%$ loss in body weight in the last 6 months, bleeding disorder, SIRS, sepsis, septic shock, elevated BMI, age, gender, ASA class, and ethnicity.

The above variables were used to construct a risk model. Examining multivariate regressions on this model, we found that patients with elevated pre-operative T-bili experienced longer average operative times, and increased likelihood of 30-day post-operative morbidity and mortality. Statistically significant early post-operative morbidities included acute renal failure, unplanned intubation, need for blood transfusion, and septic shock.

The average operative time in patients without elevated pre-operative T-bili was 65.1 min. For elevated T-bili, our results were as follows: T-bili 1.1 to 2.0 gm/dL was 71.7 min ($p<0.05$). T-bili 2.1 to 5.0 gm/dL was 74.6 min ($p<0.05$). T-bili 5.1 to 10.0 gm/dL was 77.9 min ($p<0.05$). T-bili 10.1 to 15gm/dL was 87.4 min ($p<0.05$).

Likelihood of morbidity and mortality for patients without elevated pre-operative T-bili was 2.3% and 0.09%, respectively. Further examination of patients with T-bili 5.1 to 10.0 gm/dL showed that in addition to longer operative time, they also had an increased likelihood of morbidity at 3.4% ($p<0.05$) and mortality at 0.25% ($p<0.05$). This was also the case with T-bili 10.1 to 15 gm/dL with an increased morbidity of 5.0% ($p<0.05$) and mortality of 0.61% ($p<0.05$).

Conclusion: Elevated pre-operative total bilirubin level is an independent risk factor for prolonged operative time, early morbidity, and mortality. Allowing pre-operative hyperbilirubinemia to normalize prior to cholecystectomy may optimize intra-operative

and early post-operative outcomes.

P41. LIMITED UTILITY OF GENE EXPRESSION CLASSIFIER TESTING IN SURGICAL PATIENTS WITH BETHESDA III CATEGORY THYROID NODULES

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Background: With implementation of the Bethesda System for Reporting Thyroid Cytopathology (BSRTC), thyroid nodules designated as atypia or follicular lesion of undetermined significance (AUS/FLUS) or Bethesda III category by FNA remain a clinical dilemma for clinicians and surgeons alike. Gene expression classifier (GEC) testing was developed to help further stratify patients with Bethesda III thyroid nodules as benign or suspicious for thyroid cancer. This study evaluates the utility of this GEC testing in surgical patients with Bethesda III category thyroid nodules.

Methods: A retrospective review of prospectively collected data of 760 consecutive patients with index thyroid nodules who underwent FNA and thyroidectomy was performed. FNA results were based on the BSRTC system, and GEC testing was later utilized in some patients with Bethesda III thyroid nodules and classified as benign or suspicious for malignancy. Such patients underwent initial thyroid lobectomy for definitive diagnosis unless there was a history of radiation exposure, familial thyroid cancer, obstructive symptoms, bilateral nodules and/or patient preference for which total thyroidectomy was performed. All patients with Bethesda III thyroid nodules, and a subset who underwent GEC testing, were subdivided into malignant or benign groups based on final pathology.

Results: Of the entire surgical series, 140 patients had Bethesda III thyroid nodules of which 58 underwent GEC testing and 82 did not. Of the 58 patients with GEC testing, 55 had a suspicious result whereas 3 had a benign result. On final pathology, 49% (27/55) of patients with suspicious GEC results thyroid had malignancy. Of the 3 patients with benign GEC testing, 2 had malignancy on final pathology. In the 82 patients who did not undergo GEC testing 52% (43/82) had malignancy on final pathology. There was no statistically significant difference in the malignancy rate between patients who did and did not undergo GEC testing, respectively (49% vs. 52%, $p=0.73$).

Conclusion: In surgical patients with Bethesda III category thyroid nodules by FNA, there was a greater than expected malignancy rate. Moreover, patients with Bethesda III thyroid nodules and suspicious GEC results had a higher than expected malignancy rate comparable to those patients without GEC testing. Therefore, GEC testing may have limited utility in surgical decision making, as this patient population is already highly selected for malignancy due to other factors. Surgeons should assess their local institutional experience to determine whether there is added utility of GEC testing for Bethesda III thyroid nodules in their everyday clinical practice.

P42. PREDICTORS OF POOR QUALITY OF LIFE IN PATIENTS UNDERGOING MAJOR PANCREATIC RESECTION

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Background: Although significant advances have been made in pancreatic resection, post-operative morbidity remains high. The objective of this study is to determine what perioperative factors are associated with a reduced quality of life (QoL) following major pancreatic resection.

Methods: We prospectively identified patients who underwent open pancreatic resection. QoL was measured with the Functional Assessment of Cancer Therapy- Hepatobiliary questionnaire, which consists of functional well-being (FWB), social well-being (SWB), physical well-being (PWB), emotional well-being (EWB), and the hepatobiliary cancer subscale (HCS). Surveys were completed at baseline, 2 weeks, and 1-, 3-, and 6-months after surgery. Multilevel regression modeling was used to determine the variability in each domain. A linear spline was used to allow different trajectories within the first 2 weeks (postoperative) and thereafter (recovery).

Results: Among 70 patients, 7 (10%) patients were >75 years old, 49 (70%) had cancer, 51 (73%) underwent pancreaticoduodenectomy, 15 (21%) received neoadjuvant chemotherapy, 27 (39%) received adjuvant chemotherapy, 15 (21%) had a Clavien-Dindo Grade 3 complication, 23 (33%) had a LOS >10 days, and 18 (26%) were readmitted within 90 days. Patients completed a mean of 4.3 surveys (range 1-5) for a total of 300 surveys. Both PWB and FWB significantly decreased postoperatively (-4.3 and -3.7 points, respectively) followed by a significant increase during recovery (0.8 and 1.3 points per month, respectively). In contrast, SWB and EWB increased following surgery (0.92 and 2.93 points, respectively). On multivariate analysis, although patients with a grade 3 complication had a significant decrease in postoperative PWB and HCS (both $p < 0.05$), their total QoL score returned to baseline (1262.8) by 3 months postoperatively (1292.9). Compared to distal pancreatectomy, patients undergoing pancreaticoduodenectomy had a significant decrease in only postoperative HCS ($p = 0.032$) and their total QoL score returned to baseline by 3 months (1292.9). Interestingly, a cancer diagnosis had a reduced drop in postoperative FWB and total QoL score; however, these patients subsequently recovered more slowly in both domains (all $p < 0.05$). A cancer diagnosis was also associated with a slower EWB recovery ($p = 0.007$). No domain was impacted by neoadjuvant chemotherapy; however, patients receiving adjuvant chemotherapy had a slower recovery in the HCS.

Conclusion: Patients who have a major postoperative complication have a significant decrease in QoL following major pancreatic resection; however, their QoL returns to baseline by 3 months postoperatively. Similarly, patients undergoing pancreaticoduodenectomy return to baseline QoL by 3 months postoperatively. Importantly, neoadjuvant chemotherapy had no impact on QoL and emotional well-being increased following major pancreatic resection.

P43. TEVAR COMPLICATIONS REPORTED IN THE FOOD AND DRUG ADMINISTRATION MANUFACTURER AND USER FACILITY DEVICE EXPERIENCE DATABASE

Neel A. Mansukhani, Meraaj S. Haleem, Mark K. Eskandari

Northwestern University

Background: Thoracic endovascular aneurysm repair (TEVAR) has rapidly gained popularity compared to traditional open surgical repair for treatment of a wide variety of thoracic aortic pathologies. The purpose of this study is to ascertain rare adverse events associated with thoracic aortic stent graft systems and their timing post procedure.

Methods: The Food and Drug Administration's Manufacturer and User Facility Device Experience (FDA--MAUDE) voluntary database was surveyed for TEVAR devices reported over the course of one year (January 1 to December 31, 2014). The data abstracted included indication for treatment, device used, and adverse events.

Results: A total of 443 original submissions to the FDA-MAUDE database regarding TEVAR devices were reviewed. The most common pathologies treated were thoracic aortic aneurysm (n=299, 67.6%) and type B aortic dissection (n=111, 25.1%). Of thoracic aortic dissections treated, 29 (26.1%) were acute, 23 (20.7%) were chronic, and 59 (53.1%) were unspecified. Intra-procedural events included delivery system failures (deployment malfunction, n=45; retained deployment materials, n=4; aorto-Å-esophageal/aorto-Å-bronchial fistula, n=1; and iatrogenic retrograde dissection/intramural hematoma/penetrating aortic ulcer, n=5). Early (within 30 days) post-Å-procedure events included stroke (n=13), paraplegia/paraparesis (n=24), iatrogenic retrograde dissection (n=11), aorto-esophageal/aorto-bronchial fistula (n=2), and stent graft infection (n=1). Late (over 30 days) post-procedure events reported were endoleaks (n=51), dissection (n=22), aorto-esophageal/aorto-bronchial fistula (n=7), and stent graft infection (n=5). Overall, the most common adverse events reported were endoleaks (38.2%), procedure related dissection/penetrating aortic ulcer/intramural hematoma (15.1%), and neurologic events (12.2%). Of reported neurologic events, 27.8% were stroke, 68.5% were paraplegia, and 3.7% were unspecified.

Conclusion: TEVAR has been a valuable addition for the treatment of a diverse group of thoracic aortic diseases; however, unique unanticipated complications may occur at the time of procedure and up to 9 years post-operatively, precluding a successful outcome.

P44. LAPAROSCOPIC-ASSISTED VERSUS OPEN TOTAL PANCREATECTOMY AND ISLET AUTOTRANSPLANTATION: A CASE-MATCHED STUDY OF PEDIATRIC PATIENTS

Megan Berger, Ty Dunn, Kaustav Majumder, Melena D. Bellin, Sarah J. Schwarzenberg, David E.R. Sutherland, Srinath Chinnakotla
University of Minnesota

Background: Chronic pancreatitis is a rare but debilitating disease affecting pediatric patients. Total Pancreatectomy and Islet Autotransplantation (TPIAT) is a potential treatment for patients who are refractory to medical endoscopic or surgical drainage procedures. A partially laparoscopic approach allows for a smaller incision while simultaneously providing excellent visualization of the distal pancreas and spleen during resection. A minimally-invasive approach has proven advantageous for other pediatric procedures, but its value is not clear for this rare operation. This retrospective review compares short and long-term outcomes between patients who receive laparoscopic-assisted versus open TPIAT

Methods: Children (n=21) who underwent hand-assisted laparoscopic TPIAT from 2013-2015 were compared with case-matched children (n=21) who underwent open TPIAT from 2011-2015. Patients were matched based on age, gender, duration of pancreatitis, previous surgery/endoscopic procedures, and pancreatic fibrosis scores. Data reviewed included post-operative complications, operative time, estimated blood loss, intraoperative blood transfusions, number of islet equivalents (IEQ)/kg body weight transfused, hospital length-of-stay, graft function, narcotic use, and Patient Scar Assessment Questionnaire (PSAQ) scores. Between-group differences were compared using Fisher's exact, Chi-square, ANOVA, or T-tests.

Results: There was no perioperative mortality. Surgical complications were similar between the two groups (p=0.51) and included wound complications (n=11), chyle leak (n=7), bowel obstruction (n=5), bile leak (n=3), GI bleed (n=2), and pneumonia (n=1). Operative times were not significantly different (p=0.18) with a mean of 567±23 minutes for open and 612±23 minutes for hand-assisted laparoscopic cases. EBL was nearly identical between groups (313±55 mL in open vs. 310±55 mL in laparoscopic, p=0.96). The mean units of red blood cell transfused per patient intraoperatively did not differ significantly between groups with 0.67±0.17 units transfused/patient for open and 0.43±0.18 units transfused/patient for laparoscopic-assisted (p=0.34). The mean number of islet equivalents (IEQ)/kg body weight did not differ significantly between open (4352±651 IEQ/kg) and laparoscopic-assisted cases (5751±679 IEQ/kg), p=0.15. Hospital length-of-stay did not differ between groups with a mean of 20.67±2.40 days for open vs. 22.10±2.22 days for laparoscopic-assisted, p=0.66. The overall rate of insulin independence at 1 year was 28.6% with an additional 37.1% of patients receiving only once-daily long-acting insulin. There was no difference in rates of insulin independence between the two surgical groups (p=1.0). There was no difference in prevalence of narcotic use at 3 months (p=1.0), 6 months (p=0.06), and 1 year (p=0.42) post-operatively. Patient satisfaction with the surgical scar was similar between the groups (p=0.26).

Conclusion: Preliminary data indicates that outcomes for hand-assisted laparoscopic TPIAT are comparable to open TPIAT in all measures. In young patients, a minimally-invasive approach does not compromise safety, effectiveness, or operative efficiency and may be used based on surgeon and patient preference.

P45. CT IMAGING DOES NOT INCREASE THE RISK OF SECOND MALIGNANCY IN PATIENTS WITH COLORECTAL LIVER METASTASES

Rachel K. Voss, Bradford J. Kim, Evelyne M. Loyer, Ryan W. Day, Chaan Ng, Jean- Nicolas Vauthey, Thomas A. Aloia

The University of Texas MD Anderson Cancer Center

Background: For patients with colorectal liver metastases, reported estimates of risk from CT radiation have led to a shift in imaging modalities and protocols. Recent studies, however, indicate that the magnitude of risk from CT radiation may have been overstated. To determine the relative risk of developing a secondary malignancy as a result of radiation doses from frequent diagnostic imaging in patients with colorectal liver metastases (CLM) being treated with curative intent.

Methods: From a prospectively maintained institutional liver surgery database, 639 consecutive patients who underwent first-time surgical resection from 2003-2008 for CLM were identified. This time frame was chosen to ensure a minimum of 5 years of follow-up and it spans a period with a uniform CT radiation protocol for abdominal imaging. Expected incidence for development of a second malignancy was calculated for each follow up year on a per-patient basis from the CDC Wonder Online Databases, which account for US invasive cancer incidence using year of interest, age, gender, race, and ethnicity. The expected incidence calculated from the CDC Wonder Online Database was compared to the observed incidence and rate of secondary malignancies in the study cohort. Additionally, the total cumulative radiation dose from all CT-based scans from the preoperative period to the date of last followup was compared to the incidence of observed second malignancies.

Results: The study cohort included 60% women and 40% men, with a median age at surgery of 63 years (18-89 years). The median overall survival was 4.17 years, including 244 (38.2%) actual 5-year survivors, 23 (3.6%) actual 10-year survivors, and 246 patients (38.5%) alive at last follow-up. After excluding patients with less than 6 months of postoperative follow-up, a total of 565 patients were assessed for secondary malignancy. In total, 16 patients (2.8%) developed a secondary malignancy during follow-up. Patients with and without secondary malignancies received a similar amount of radiation from diagnostic imaging (median estimated radiation dose 596 mSv [IQR 371-836] vs. 659.9 mSv [IQR 300-841], $p=0.983$). After adjusting for year, age, gender and ethnicity the expected incidence of second malignancy for 8 of the 10 postoperative years of follow-up was higher than the observed incidence of second malignancy, and not statistically different. The observed mean incidence was 0.70% per year of patient follow-up, while the average of the annualized expected malignancy rates was 1.29%, confirming no increased risk from accumulated CT radiation doses.

Conclusion: CT imaging in the workup and follow-up of patients with colorectal liver metastases is safe. Given that well performed CT remains the most thorough, consistent, prognostic, efficient, comfortable, inexpensive, and accurate staging modality, it should remain the standard for patients with CLM.



Invited Speakers

INVITED SPEAKERS



Measuring Surgical Performance

Monday, November 7, 2016

1:30pm – 2:30pm

Commodore C/D

Introduction: R. James Valentine, MD

Featuring:

Clifford Y. Ko, MD, MS, MSHS

American College of Surgeons

Dr. Clifford Ko is the Director of the Division of Research and Optimal Patient Care at the American College of Surgeons. He oversees all the quality improvement programs, including the Bariatric Surgery Accreditation Program, the Cancer

Accreditation program, the Trauma Verification program, the Surgeon Specific Registry, the Pediatric Surgery Verification Program, and the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP). He also serves as the Director of ACS NSQIP, which recently was recognized with the Eisenberg Award from the National Quality Forum/Joint Commission.

Dr. Ko's work focuses on surgical quality of care, including quality measurement, process improvement, and achieving high reliability in surgical care. He has served in advisory roles to national and international efforts for achieving higher quality and safety including the World Health Organization, the Institute of Medicine, the National Quality Forum amongst others. He has received millions of dollars in grant funding to study quality of care from sources that include the National Institutes of Health, the Centers for Disease Control and Prevention, the American Cancer Society, the Centers of Medicare and Medicaid Services, the Agency for Healthcare Research and Quality, and the Veterans Administration. He has published over 300 peer reviewed manuscripts and has written more than 20 book chapters. He is frequently invited to speak nationally and internationally, and was recognized by Becker's Hospital Review as one of the top 50 experts leading the field of patient safety.

Current national initiatives for Dr. Ko include overseeing the writing of the ACS Quality Manual, a data registry project to standardize ACS data automation/analysis/reporting, and development of a geriatric surgery quality program.

Clinically, Dr. Ko is a double board-certified surgeon with a practice currently focusing on patients with colorectal cancer. At UCLA, he is the Robert and Kelly Day Professor of Surgery, has won the Faculty Teaching Award three times, and is recognized as one of the Best Doctors in America. He is also professor of health services at the UCLA School of Public Health.

Dr. Ko received his B.A (Biology), M.S. (Biological/Medical Ethics), and M.D. from the University of Chicago. He also received a Masters of Science Degree (Health Services/Outcomes Research) from the University of California, Los Angeles during his time as a Robert Wood Johnson Clinical Scholars Fellow at UCLA and RAND. Dr. Ko completed his General Surgery Residency at UCLA Medical Center, and obtained specialty training at the Lahey Clinic in Boston in Colon and Rectal Surgery.

INVITED SPEAKERS CONTINUED



Purpose, Leadership, and the Team

Monday, November 7, 2016

2:30pm – 3:30pm

Commodore C/D

Introduction: Charles R. Scoggins, MD

Featuring:

Rear Admiral Edward G. Winters, III

United States Navy

Rear Admiral (RADM) Ed Winters was born June 26, 1956 in Hanover, N.H. In June 1960, his family moved to Largo, Florida. He graduated from the University of West Florida in Pensacola in 1979 with a Bachelor's of Science degree.

In 1980 he received his commission in the US Navy through Officer Candidate School, Newport, R.I. From there, he reported to Basic Underwater Demolition/Sea, Air, Land (SEAL) training in Coronado, California and graduated with Class 112 in 1981.

Ensign Winters began his career as a SEAL Underwater Demolition Team (UDT) 22 in Virginia Beach, Va. As a platoon commander, LT(jg) Winters deployed to Lebanon (1982-83). LT Winters transferred to Naval Special Warfare Development Group (NSWDG) in Dam Neck, Va in December 1983 where he was assigned as Assistant Squadron Commander, Command Operations Officer and Squadron Commander.

In 1989 LT Winters was assigned to U.S. Special Operations Command (USSOCOM) in Tampa, Florida, as the Joint Special Operations Command's (JSOC's) first liaison and action officer to USSOCOM. Following his assignment to USSOCOM, in August 1991 LCDR Winters was assigned as Executive Officer SEAL Team Four in Virginia Beach.

LCDR Winters attended the Naval Postgraduate School in Monterey, CA (1993-4) earning a master's in National Security Affairs - Special Operations and Low Intensity Conflict.

CDR Winters returned to NSWDG in early 1995 as the current operations officer and then the operations officer into 1998 when he assumed command of SEAL Team 4. During this assignment he deployed throughout Latin America and then to Bosnia-Herzegovina as the deputy commander of a Combined Joint Special Operations Task Force. Departing SEAL Team 4 in 2000, CDR Winters returned to Bosnia-Herzegovina for a one-year deployment as commander of a classified joint task force.

In 2001 Captain Winters reported to Joint Special Operations Command (JSOC) at Fort Bragg, N.C., serving as the deputy operations officer and operations officer forward. During his tour he deployed four times with a classified Joint Task Forces (JTF) in support of Operation Enduring Freedom (OEF), including one deployment as the JTF commander. In 2003 he returned to NSWDG and took command. During this tour he made another four deployments with the JTF in support of OEF. Following his command tour, he was assigned in 2006 to USSOCOM as Director, Interagency Task Force at the Center for Special Operations. Also, while assigned to USSOCOM, he deployed to Iraq for over 15 months (2007-8) as commander, Iraqi National Counterterrorism Force Transition Team. He was frocked to Rear Admiral in April 2007 prior to this deployment.

Shortly after his return from Iraq, RDML Winters took Command of Naval Special Warfare Command (2008-11). In 2011 RADM Winters deployed to Iraq one last time for a one year tour initially as part of the Operation Iraqi Freedom forces but remained in Iraq after the draw down as Deputy Director of the Office of Security Cooperation – Iraq (OSC-I). Upon Return from Iraq, RADM Winters returned to USSOCOM and was assigned as the Director Of Operations for a year until he retired from active duty on 31 Aug 2013.

Winters' decorations include the Special Warfare breast insignia, Naval Parachutist breast insignia, two Defense Distinguished Service Medals, three Defense Superior Service Medals, Legion of Merit, three Bronze Star Medals, five Defense Meritorious Service Medals, the Navy Meritorious Service Medal, the Joint Service Commendation Medal, the Navy and Marine Corps Commendation Medal, the Navy and Marine Corps Achievement Medal and various unit and personal citations.

INVITED SPEAKERS CONTINUED



WSA Inaugural Nonie Lowry Oration
Triple Negative Breast Cancer:
Light through the Darkness

Tuesday, November 8, 2016

9:20am – 9:50am

Commodore C/D

Introduction: R. James Valentine, MD

Featuring:

Anees B. Chagpar, MD, MSc, MA, MPH, MBA
Yale University

A long-term member of the Western Surgical Association, Anees currently is the Director of the Breast Center -- Smilow Cancer Hospital at Yale-New Haven, an Associate Professor in the Department of Surgery, Yale School of Medicine, and the Assistant Director for Global Oncology at Yale Comprehensive Cancer Center. Born and raised in Canada, she completed her BSc in Honors Biochemistry and MD with Honors in Research at the University of Alberta, and her general surgery residency training and MSc at the University of Saskatchewan. She went on to become the inaugural Susan G. Komen Interdisciplinary Breast Fellow at the University of Texas M. D. Anderson Cancer Center, prior to joining the University of Louisville as an Assistant Professor of Surgery. She then completed her MPH in Clinical Effectiveness at the Harvard School of Public Health and an MA in Bioethics and Medical Humanities at the University of Louisville. She rose rapidly through the ranks to become an Associate Professor with tenure and an Academic Advisory Dean. She built the first nationally accredited Breast Center in Kentucky at the James Graham Brown Cancer Center prior to being recruited to Yale where she led the effort for Yale to become the first NCI designated Comprehensive Cancer Center in the Northeast to have a nationally, and internationally, accredited breast center. She is a busy breast surgical oncologist who participates in investigator-initiated and cooperative group clinical trials, as well as translational and clinical research. She enjoys teaching and mentoring students, residents, fellows and junior faculty, and is passionate about leadership in academic medicine, having most recently completed an MBA for Executives with a focus on Leadership in Healthcare at Yale's School of Management. She is humbled and honored to present the inaugural Nonie Lowry oration.

FUTURE MEETINGS

November 4 – 7, 2017

Omni Scottsdale Resort & Spa at Montelucia
Scottsdale, Arizona

November 3 – 6, 2018

JW Marriott Los Cabos Beach Resort & Spa
Mexico



Bylaws

BYLAWS

ARTICLE I: Membership

SECTION 1. The ACTIVE MEMBERSHIP shall be limited to three hundred and fifty (350). The HONORARY MEMBERSHIP shall be limited to fifteen (15).

SECTION 2. ACTIVE MEMBERS. To be eligible for consideration for active membership, an individual shall be a graduate of an accredited medical school, shall have completed formal residency training, and shall have been established in his/her current practice locale for a minimum of two years. To be considered, the individual must be board certified in his or her specialty, have established an excellent reputation as a surgeon, and be a Fellow of the American College of Surgeons. The individual must be recommended by the Membership Committee of the Association and approved by at least three-fourths of the Executive Committee to be presented to the members of the Association. Nominees to be Active Membership shall be elected to membership by the favorable vote of three-fourths of the members voting by secret ballot at the Executive Session of the Annual Meeting. Membership shall not be denied because of race, creed, color, or sex.

Under special circumstances, renowned surgeons not meeting the above requirements may be granted membership.

A nomination shall be initiated by a member sponsor who shall be responsible for obtaining the curriculum vitae of the nominee which is to be submitted on a form provided by the Secretary of the Association. The nomination shall be endorsed by two (2) members. The completed nomination form and letters of recommendation from the sponsor and endorsers must be received in the office of the Secretary by May 1 of the year in which the nominee is to be considered.

SECTION 3. The Secretary will solicit additional letters of comment on the nominees from members of the Association. Each completed nomination received by the Secretary shall be presented to the Chairman of the Membership Committee. The Membership Committee shall consider all nominations and make recommendations to the Executive Committee. A final list of nominees shall be prepared by the Executive Committee for presentation to the members at the Annual Business Meeting for approval and acceptance.

BYLAWS CONTINUED

SECTION 4. Upon notification by the Secretary of election to membership in the Association, the nominee must accept the election within three (3) months by payment of the initiation fee and the annual dues to the Treasurer of the Association. To become an Active member, the nominee shall be expected to attend the first Annual Meeting after election to be introduced to the Association and to receive the certification of membership. Should the nominee fail to attend the first subsequent meeting, the second Annual Meeting must be attended. If the nominee is unable to attend the second meeting, membership will not be conferred subject to action by the Executive Committee. Fees contingent on membership will not be refunded.

SECTION 5. Nominees who have not been recommended for active membership after three (3) consecutive years of consideration by the Membership Committee and the Executive Committee shall be withdrawn from consideration. This action shall not preclude subsequent nominations for membership after an interval of two (2) years.

SECTION 6. A Senior Membership shall be any active member who has reached the age of sixty (60) years, or has retired from the active practice of surgery. He/she may be recommended for Senior Membership for other acceptable reasons if so ordered by the Executive Committee. A Senior Member shall retain all rights and privileges of membership, but he/she shall be relieved of the rules of attendance. He/she shall pay dues and any assessments until the age of sixty-five (65) or upon retirement, whichever shall occur first.

SECTION 7. HONORARY MEMBERS may be selected from individuals of scientific eminence or from among those who have made unusual contributions to surgery. They shall be proposed to the Association by the Executive Committee and elected in the same manner as active members. They shall not be required to pay dues or fees nor shall they be privileged to vote or hold office.

SECTION 8. The resignation of a member in good standing submitted in writing may be accepted by the Executive Committee.

SECTION 9. Any Active Member who fails to attend three consecutive annual scientific meetings shall be notified of his/her absences by the Secretary. Written requests for excused absence will be considered by the Executive Committee. If the truant member fails to attend the next successive Annual Meeting, membership shall be forfeited unless for good and sufficient cause which the Executive Committee shall determine otherwise.

SECTION 10. Any member may be expelled for unprofessional or unethical conduct by unanimous vote of the Executive Committee. This action requires confirmation by the Association at the next Executive Session. Charges shall be preferred in writing and signed by three (3) members before consideration by the Executive Committee. If the vote of the Executive Committee is not unanimous, the charges may be adopted by mutual consent of the members of the Executive Committee, or they may be presented by the Executive Committee to the Association in Executive Session.

A three-fourths vote of the members voting by secret ballot (Article VI, Section 2) at the Executive Session of the Annual Meeting shall be required for expulsion.

SECTION 11. An active member, temporarily residing outside the continental limits of the United States or Canada, may be placed on temporary inactive status if such request is presented in writing and approved by the Executive Committee. Temporary inactive status relieves the member of attendance requirements and dues payment. Such status shall be granted for a period no longer than three (3) years.

ARTICLE II: Duties of Executive Committee and Officers

SECTION 1. The EXECUTIVE COMMITTEE shall be the executive body of the Association and shall consider all the business and policies pertaining to the affairs of the Association. It shall make nominations for officers and fill vacancies arising among officers. It shall select the sites and dates for Annual Meetings and appoint the Chairman of the Committee on Local Arrangements. It shall recommend the amount of the dues for the consideration of the membership. It shall make recommendations for Active, Senior, Honorary and Temporary Inactive Membership and shall act upon resignations and forfeitures of membership as necessary. It shall consider and act upon charges of unprofessional conduct and charges against members for alleged offenses against the Constitution and Bylaws. It shall also submit, for the vote of the membership in Executive Session, its recommendation concerning expulsion of a member. It shall direct the conservation and investment of funds held by the Association.

A report of the Executive Committee shall be presented to the members during the Executive Session of the Association during each Annual Meeting. No decisions or recommendations of the Executive Committee shall be binding on the Association unless accepted by a three-fourths vote of the members voting in Executive Session at the Annual Meeting.

Meetings of the Executive Committee shall be held at the call of the Chairman of the Executive Committee. Seven members present shall constitute a quorum.

BYLAWS CONTINUED

The most immediate Past President of the Association in attendance shall be Chairman of the Executive Committee, and the Secretary of the Association shall be Secretary of the Executive Committee.

SECTION 2. The PRESIDENT shall preside at the meetings of the Association, preserve order, regulate debates, appoint committees not otherwise provided for, announce results of elections, perform all other duties appertaining to his office, ex-officio member of all committees. The President shall hold office for one (1) year. In the absence of the President, the order of succession to the Chair shall be the First Vice President, the Second Vice President and then the Senior Member of the Executive Committee present.

SECTION 3. The SECRETARY shall attend to the correspondence of the Association, shall notify officers and new Members of their election, and shall notify and instruct new members of the Program Committee, the Membership Committee, and of other specially designed committees. The Secretary shall keep minutes of the Executive Committees executive sessions. Such minutes shall be the property of the Association and shall be the Custodian of the Seal of the Association and shall, upon direction by the Executive Committee, affix it to papers and documents. Together with the President, the Secretary shall sign all official papers. The Secretary shall pass upon all bills for expenses to be paid by the Treasurer. The Secretary shall publish a list of all nominees presenting their age, address, surgical board certification status, College of Surgeons fellowship status, and the names of the sponsor and endorsing members. This information on the nominees will be mailed to the members of the Association with a request for comment on individual nominees at an appropriate interval before the meeting of the Membership Committee. The Secretary shall send invitations to guests invited to attend the Annual Meeting at the request of a member. The Secretary shall be custodian of the records of attendance of all meetings of the Association. The Secretary shall make an annual report to the Executive Committee and to the Membership at the Annual Executive Session of the Association. The Secretary shall be an ex-officio member of all committees.

SECTION 4. The TREASURER shall be the custodian of all the moneys of the Association and shall be responsible to the Executive Committee. The Treasurer shall keep full and accurate books of account, containing a record of all moneys received and expended, which books shall be the property of the Association and open to the inspection of the authorized officers at all reasonable times. The Treasurer shall collect initiation fees, dues and assessments, and shall report to the Executive Committee the names of those members in arrears. The Treasurer shall present an annual report of account for audit which shall be made a part of the report of the Executive Committee. The Treasurer shall cooperate with the Chairman of the Local Committee on arrangements regarding finance.

SECTION 5. The Association shall have an official journal chosen by vote of the membership. The RECORDER will be the liaison between the Association and the editor of the official journal. The Recorder shall contact the corresponding authors of all scientific papers presented before the Association. Authors shall be instructed to forward manuscripts to the Editor of the official journal prior to presentation at the annual meeting. The Recorder shall be responsible for the Transactions of the Western Surgical Association, published in the Program Book. The Transactions includes a list of past presidents and meeting places; a list of J. Bradley Aust awardees; the previous year's scientific program; the previous year's Presidential Address; and a list of deaths and memorials. The Recorder will send one copy of the Transactions to the National Library of Congress to be kept in perpetuity. The Recorder shall maintain an up-to-date file of the membership.

SECTION 6. The RECORDER shall act as Historian for the organization and maintain and transfer appropriate archival material from the organization to the Library of Medicine.

SECTION 7. DISTRICT REPRESENTATIVES. There shall be four (4) District Representatives, one of whom shall be elected each year for a term of four (4) years. The tenure of office shall be staggered in order to facilitate continuity in committee activities. These representatives shall be elected to represent widely diverse geographical sections of membership. They shall represent the best interests of the entire Association to the membership of their general areas, and in turn shall represent the will and pleasure of the membership of their general geographical areas to the Executive Committee.

SECTION 8. The Association is represented on the American Board of Surgery. When requested by the Board, the Executive Committee shall submit the names of three (3) member nominees for each position to the membership for approval of an Annual Meeting. Upon approval the panel of nominees will be forwarded to the American Board of Surgery who will notify the Association of the nominees selected for this office.

SECTION 9. The Association is regularly represented on the Board of Governors of the American College of Surgeons by one (1) member. When required, the Executive Committee shall submit the names of three (3) nominees approved by the membership for this office.

SECTION 10. The Association is regularly represented on the Advisory Council on Surgery of the American College of Surgeons by one member. When requested, the Executive Committee shall submit the names of three (3) nominees approved by the membership of this office.

BYLAWS CONTINUED

ARTICLE III: Initiation Fee and Annual Dues

SECTION 1. Every active member on his/her election shall pay an initiation fee, thereby acknowledging and accepting the Constitution and Bylaws. The amount of the fee may be changed at any Annual Meeting on recommendation of the Executive Committee and approved by a majority of the membership of the Association at the Executive Session of the Annual Meeting.

SECTION 2. Annual dues of every active member shall be paid by May 1 of each calendar year. The amount of the dues may be changed at the Executive Session of the Association on recommendation of the Executive Committee and approval by the majority of the members present.

SECTION 3. Any member who fails to pay dues or assessments for one year shall be notified by the Treasurer in writing. If the member fails to pay the required dues within two (2) months thereafter, the membership will be forfeited. The Treasurer shall notify the Executive Committee of this forfeiture. Waiver of membership fees or assessments shall be the prerogative of the Executive Committee.

ARTICLE IV: Programs and Publications

SECTION 1. A balanced program for the Annual Scientific Meeting will be arranged by the Program Committee, a copy of which shall be distributed to the membership. Abstracts submitted for consideration to be included in the program shall represent original material which shall not have been submitted for publication previously.

SECTION 2. All papers read before the Association shall be presented by a member or sponsored guest. The sponsoring member or co-author member shall be responsible for the content and quality of presentation. An excuse not to do this will require permission of the President.

SECTION 3. The time allowed for presentation of papers shall be determined by the Program Committee. The manuscript must be completed for publication in accordance with the guidelines of the official journal of the Association, and must be submitted in a timely fashion in accordance with published guidelines of the Association.

SECTION 4. The Executive Committee shall have full power to omit from the published records any paper, in part or in whole, which may have been read before the Association.

SECTION 5. The Executive Committee shall cooperate with the editorial board of the official journal of the association to obtain prompt publication of the scientific papers.

SECTION 6. The expense of publication of papers and costs in excess of that allowed by the publisher shall be subject to assessment against the author. All papers published in the official journal identified with the Western Surgical Association shall have been read before the Association.

ARTICLE V: Meetings

SECTION 1. The place and time of the Annual Meeting and the Chairman of the Committee on Local Arrangements shall be selected by the Executive Committee.

- a. The date and location of the next two (2) succeeding meetings shall be published in the program at the time of the Annual Meeting each year.
- b. After such publication, the selected place of the meeting may be changed only by unanimous vote of the Executive Committee.
- c. Members shall sign the permanent register of the Association as a record of their attendance.
- d. A special register shall be provided for guests.

SECTION 2. A special meeting of the Association may be called at any time by the President, with the concurrence of the Executive Committee, and it shall be his duty to do so upon receipt of a written petition signed by ten (10) percent of the members.

SECTION 3. A member may invite a Doctor of Medicine or other distinguished scientist to participate in the scientific and social functions of the Association. A member inviting a guest to the Annual Scientific Meeting should send the name to the Secretary at least one (1) month before the date of the Annual Meeting. The Secretary shall forward an official invitation to the guest. The invited guests attending the meeting will receive a program of the meeting at the time of their registration. The President may extend to guests the privilege of participating in the discussions. Each guest will be assessed a Registration Fee. A senior medical student or a resident in surgery from an accredited residency program may attend the scientific meetings without charge upon presentation of appropriate identification and certification at the time of registration.

BYLAWS CONTINUED

ARTICLE VI: Quorum

SECTION 1. A minimum of twenty-five (25) percent of the membership shall be required at any Executive Session to form a quorum for transaction of the ordinary business of the Association, for elections, for changes in the Constitution and Bylaws, or for ordering assessments.

SECTION 2. A minimum of fifty-one (51) percent of the membership shall be required to form a quorum to consider the expulsion of a member.

ARTICLE VII: Committees

SECTION 1. All standing and ad hoc committees shall act in an advisory capacity to the duly elected Executive Committee of the Association.

SECTION 2. The Membership Committee shall be composed of six (6) members: four (4) presidential appointees, each to serve for a period of four (4) years; the other two (2) members shall be District Representatives assigned by the Executive Committee for the latter two-year (2-year) portion of their term of office. The President, the Secretary, and the Treasurer shall be ex-officio members of the Committee.

- a. The Chairman shall be the senior appointed member of the Committee, i.e. that appointed member who is in his/her fourth year on the Committee.
- b. The deadline for submission of applications to the Secretary of the Association shall be May 1 preceding the Annual Meeting.
- c. The Secretary of the Association shall send all applications and related data to this Committee at an appropriate interval preceding the Annual Meeting.
- d. The Membership Committee shall convene and present annually to the Executive Committee the complete list of candidates and their recommendation on each of them.

SECTION 3. The Program Committee shall consist of six (6) members: four (4) presidential appointees, each to serve for a period of four (4) years; the other two (2) members shall be District Representatives assigned by the Executive Committee for the first two-year (2-year) portion of their term of office. The President, the Secretary, and the Recorder shall be ex-officio members.

- a. The Chairman shall be the senior appointed member, i.e. that appointed member who is in his/her fourth year on the Committee.
- b. The deadline for submission of abstracts to the Secretary of the Association shall be in accordance with published guidelines of the Association.
- c. After individual preliminary evaluation of all abstracts, this Committee shall convene for purposes of final selection of the program for the Annual Meeting.

SECTION 4. The Executive Committee shall act as a Budget Committee with reference to necessary secretarial expenditures for officers and committee members, subject to the approval of the membership.

SECTION 5. ADVISORY NOMINATING COMMITTEE. The Executive Committee shall act as the Nominating Committee at the Annual Meeting. In turn, the Executive Committee shall appoint an Advisory Committee, consisting of the three (3) immediate Past-Presidents and the senior District Representative. The Chairman of this Advisory Committee shall be the immediate Past-President. This Advisory Committee shall discuss suitable nominees to fill the officer and representative vacancies which shall occur at the time of the Annual Meeting, and shall submit its recommendations to the Executive Committee for consideration. The President and Secretary shall serve as ex-officio members.

SECTION 6. The Executive Committee shall appoint the Chairman of the Committee on Local Arrangements at least one (1) year in advance. In coordination with the Secretary and Treasurer he/she shall be responsible for all details pertaining to the Annual Meeting unless otherwise ordered by the Executive Committee.

ARTICLE VIII: Seal and Certificate of Membership

SECTION 1. The Seal shall be circular in form and bear the name of the Association about the border. In the center shall be portrayed the Western Country, similar to the State Seal of Kansas. The Association was founded in Topeka, Kansas, 1891.

SECTION 2. The Association shall issue a Certificate of Membership signed by the President and Secretary.

BYLAWS CONTINUED

SECTION 3. The Certificate of Membership shall be as follows:

WESTERN SURGICAL ASSOCIATION
FOR THE CULTIVATION PROMOTION AND DIFFUSION OF
KNOWLEDGE OF THE ART AND SCIENCE OF SURGERY
HAS ELECTED

TO ACTIVE MEMBERSHIP
OR
HONORARY MEMBERSHIP



President _____ Secretary

Date

ARTICLE IX: Nominations and Elections

SECTION 1. Nominations for all Officers shall be made at the Executive Session of the Annual Meeting by the Executive Committee of the Association. Additional nominations may be made from the floor.

SECTION 2. The election of Officers shall take place at the Executive Session of the Annual Meeting. An affirmative vote of a majority of the members voting at the Executive Session shall constitute an election.

SECTION 3. Any vacancy occurring during the year among the Officers of the Association shall be filled by the action of the Executive Committee. Any vacancy occurring among Committee Members shall be filled by action of the President.

ARTICLE X: Order of Business

SECTION 1. Order of Business of the Executive Committee

1. Reading of minutes of last meeting
2. Reports:
 - a. Secretary
 - b. Treasurer
 - c. Recorder
3. Reports of Program and Membership Committees
4. Reports of Representatives of American Board of Surgery and the Board of Governors and Advisory Council on Surgery of the American College of Surgeons
5. Unfinished Business
6. New Business
7. Nominations:
 - a. Locations of Future Meetings
 - b. Chairman of Committee on Local Arrangements
8. The report of the Advisory Committee on Nominations shall be considered, and a slate of nominations for officers shall be prepared.
9. The report of the Executive Committee of the Association shall be discussed in preparation for its presentation by the Secretary to the membership of the Association in Executive Session at the Annual Meeting.

BYLAWS *CONTINUED*

SECTION 2. Executive Session of the Annual Meeting

1. Reading of previous year's minutes of the Executive Session of the Annual Meeting
2. Report of Executive Committee meetings to the Association by the Secretary
3. Report of the Treasurer
4. Report of the Recorder
5. Report of the Representative Board of Governors, American College of Surgeons
6. Report of the Representative American Board of Surgery
7. Report of the Representative Advisory Council on Surgery, American College of Surgeons
8. Report of Program & Membership Committees
9. Unfinished Business
10. New Business
11. Election of New Members
12. Election of New Officers
13. Adjournment

ARTICLE XI: Alterations in the Constitution and Bylaws

No part of the Constitution or Bylaws may be amended, altered or replaced, except at a regular Annual Meeting of the Association in Executive Session. The suggested amendment, alteration or repeal in the Constitution or Bylaws must have been presented in writing at the Executive Session of the previous Annual Meeting, signed by three (3) members. Notice of the proposed amendment, alteration or repeal shall be given in writing with the call to the Annual Meeting. The adoption of the suggested amendment, alteration or repeal shall be by vote of three-fourths of the members voting, a quorum being present at the Executive Session.

ARTICLE XII: Parliamentary Authority

Sturgis' Standard Code of Parliamentary Procedure, the current edition, shall be the parliamentary authority in all matters not specified in the Constitution, Bylaws or standing rules of this organization.



Past Presidents & Meeting Places

PAST PRESIDENTS & MEETING PLACES

PRESIDENT	PLACE	YEAR
S.S. Todd*	Topeka	1891
Milo B. Ward*	Kansas City	1892
Milo B. Ward*	Des Moines	1893
Lewis Schooler*	Omaha	1894
John E. Summers, Jr.*	Kansas City	1895
Thomas J. Beattie*	Topeka	1896
Joseph Eastman*	Denver	1897
David S. Fairchild*	Omaha	1898
Homer C. Crowell*	Des Moines	1899
O. Beverly Campbell*	Minneapolis	1900
August F. Jonas*	Chicago	1901
James E. Moore*	St. Joseph	1902
Alexander H. Ferguson*	Denver	1903
Charles H. Mayo*	Milwaukee	1904
Harvey D. Niles*	Kansas City	1905
Malcolm L. Harris*	Salt Lake City	1906
Charles W. Oviatt*	St. Louis	1907
William W. Grant*	Minneapolis	1908
Arthur L. Wright*	Omaha	1909
John P. Lord*	Chicago	1910
Amos W. Abbott*	Kansas City	1911
Lewis L. McArthur*	Cincinnati	1912
Jabez N. Jackson*	St. Louis	1913
Bryon B. Davis*	Denver	1914
Joseph R. Eastman*	Des Moines	1915
Lawrence W. Littig*	St. Paul	1916
Leonard Freeman*	Omaha	1917
James F. Percy*	Chicago	1918
Roland Hill*	Kansas City	1919
Arthur T. Mann*	Los Angeles	1920
Charles D. Lockwood*	St. Louis	1921
Miles F. Porter*	Minneapolis	1922
Horace G. Wetherill*	Colorado Springs	1923
Donald Macrae, Jr.*	French Lick Springs	1924
Willard D. Haines*	Wichita	1925
Robert C. Coffey*	Duluth	1926
Lewis H. McKinnie*	Omaha	1927
Kellog Speed*	Chicago	1928
E. Starr Judd*	Del Monte	1929

PAST PRESIDENTS & MEETING PLACES

Carl E. Black*	Kansas City	1930
Clarence G. Toland*	Denver	1931
Harry P. Ritchie*	Madison	1932
Samuel C. Plummer*	Cincinnati	1933
Frank R. Teachenor*	St. Louis	1934
Reginald H. Jackson*	Rochester	1935
Thomas G. Orr*	Kansas City	1936
Fred W. Bailey*	Indianapolis	1937
Casper F. Hegner*	Omaha	1938
Vernon C. David*	Los Angeles	1939
Alfred Brown*	Topeka	1940
Albert H. Montgomery*	St. Paul	1941
Willis C. Gatch*	No General Meeting	1942
Willis D. Gatch*	No General Meeting	1943
Willis D. Gatch*	Chicago	1944
James C. Masson*	Chicago	1945
Arthur R. Metz*	Memphis	1946
William M. Mills*	Colorado Springs	1947
Harry B. Zimmerman*	St. Louis	1948
Robert L. Sanders*	Santa Barbara	1949
Warren H. Cole*	Minneapolis	1950
Erwin R. Schmidt*	Colorado Springs	1951
George B. Packard*	Houston	1952
Lawrence Chaffin*	Chicago	1953
Herbert H. Davis*	Colorado Springs	1954
Michael L. Mason*	Seattle	1955
Charles G. Johnston*	Cincinnati	1956
Everett P. Coleman*	Salt Lake City	1957
James B. Brown*	Rochester	1958
James T. Priestley*	Colorado Springs	1959
Caleb S. Stone, Jr.*	Detroit	1960
John T. Reynolds*	San Francisco	1961
Jacob K. Berman*	St. Louis	1962
Charles W. Mayo*	Galveston	1963
Eugene A. Osius*	Colorado Springs	1964
Arthur J. Hunnicutt*	Omaha	1965
Walter W. Carroll*	Phoenix	1966
O. Theron Claggett*	Los Angeles	1967
Merle M. Musselman*	Chicago	1968
Arthur C. Pattison*	Dallas	1969

PAST PRESIDENTS & MEETING PLACES

PRESIDENT	PLACE	YEAR
Kenneth C. Sawyer*	Colorado Springs	1970
Raleigh R. White*	Portland	1971
Carl P. Schlicke*	Rochester	1972
Tom D. Throckmorton*	Houston	1973
Darrell A. Campbell*	San Francisco	1974
Chester B. McVay*	Colorado Springs	1975
William P. Mikkelsen*	Coronado	1976
Allen M. Boyden*	Las Vegas	1977
D. Emirick Szilagyi*	Scottsdale	1978
Harvey R. Butcher, Jr.*	Colorado Springs	1979
William H. ReMine*	Salt Lake City	1980
Paul E. Hodgson*	Albuquerque	1981
James J. Berens*	Kansas City	1982
Robert E. McCurdy*	Monterey	1983
George L. Jordan, Jr.*	Colorado Springs	1984
Martin A. Adson*	Rochester	1985
R. Dale Liechty*	Detroit	1986
Alexander J. Walt*	Dallas	1987
Melvin A. Block	Coronado	1988
J. Bradley Aust*	St. Louis	1989
David G. Ashbaugh	Scottsdale	1990
John L. Glover*	Colorado Springs	1991
Arthur J. Donovan	San Antonio	1992
George E. Block*	Seattle	1993
Basil A. Pruitt, Jr.	Palm Desert	1994
Norman W. Thompson*	Chicago	1995
Jon A. van Heerden	Portland	1996
Jack R. Pickleman	Colorado Springs	1997
Jay L. Grosfeld	Indianapolis	1998
Thomas V. Berne	Santa Fe	1999
Amilu S. Rothhammer	Dana Point	2000
J. David Richardson	San Antonio	2001
Claude H. Organ*	Vancouver, British Columbia	2002
Richard A. Prinz	Tucson	2003
Fabrizio Michelassi	Las Vegas	2004
Arthur S. McFee*	Rancho Mirage, CA	2005
Richard C. Thirlby	Los Cabos, México	2006
Merril T. Dayton	Buffalo, NY	2007
Bruce L. Gewertz	Santa Fe, NM	2008

PAST PRESIDENTS & MEETING PLACES

Wayne H. Schwesinger	San Antonio, TX	2009
Michael B. Farnell	Chicago, IL	2010
Gregory J. Jurkovich	Tucson, AZ	2011
Raymond J. Joehl	Colorado Springs, CO	2012
Clive S. Grant	Salt Lake City, UT	2013
Steven C. Stain	Indian Wells, CA	2014
William C. Chapman	Napa, California	2015
R. James Valentine	Coronado, CA	2016

**Deceased*



Deaths & Memorials

IN MEMORIAM CONTINUED

DEATHS REPORTED 2015 – 2016

Robert W. Barnes

George J. Farha

Mark L. Friedell

Edward M. Greaney

Carlos Grodsinsky

Jay L. Grosfeld

James C. Gruenberg

Paul E. Hodgson

Wishard S. Lorimer, Jr.

Frank G. Moody

William B. Rydell, Jr.

Norman W. Thompson, 1995 Past President

Nicholas Wetzel

John H. Wulsin

Nora Christine “NONIE” Lowry

IN MEMORIAM CONTINUED



Robert W. Barnes

1936 – 2014

Robert Webster Barnes, M.D. died May 28, 2014. He was born on Nov. 9, 1936 in Chicago, Ill. Robert received a Bachelor of Arts degree from the University of Colorado at Boulder in 1958 and a Doctor of Medicine degree from the University of Illinois College of Medicine in Chicago in 1961. He went on to serve three surgical residencies in the areas of general, thoracic, and vascular surgery at the University of Washington Affiliated Hospitals in Seattle. The remainder of his career was dedicated to the application and research of vascular surgery. He was Assistant and Associate Professor in the Department of Surgery at the University of Iowa from 1972-77, the first David Hume Professor of Surgery at the Medical College of Virginia from 1977-83, and Professor and Chair of the Department of Surgery at the University of Arkansas for Medical Sciences in Little Rock from 1983-99. He remained on staff at UAMS until 2003. His passion and dedication to his profession led to many contributions in the area of vascular surgery and influenced the careers of countless medical residents and surgical fellows across the country. His legacy beyond that is hallmarked by the compassion he showed toward his patients. In addition to his career, Robert was a dedicated husband and father. His passions included good music, good food and his beloved vegetable garden. Some of his fondest memories were from the last 10 years of retirement spent with his wife, Kay, in their beloved home on Beaverfork Lake. Bob and Kay's daughter, Kathleen, has been a resident at Conway HDC for over 30 years. Together, the couple championed support for Arkansas's many Human Development Centers.

Robert is preceded in death by his parents, Broda and Charlotte Barnes, and wife of 52 years, Kay. He is survived by his brother, John Barnes; his three children, David Barnes and his wife Pam, Judy Sauer and her husband Drew, and Kathleen Barnes; and four grandchildren, Clayton and Dryden Barnes, and Ellen and Ryan Sauer.

Robert lived in Little Rock and Conway for 30 years and Ann Arbor, Mich., with his daughter Judy's family for the last six months.

Tribute published on Legacy.com



George J. Farha

1927-2014

Dr. George J. Farha was co-founder of the Wichita Surgical Group, which later evolved into Wichita Surgical Specialists. He also was a champion of having Wichita as a regional medical hub. Dr. Farha was 86.

“Any more, there aren’t the health-care giants like there was once,” said Alex Ammar, a physician nephew who now leads Wichita Surgical Specialists. “But if you had to pick one physician who had the greatest impact on health care in this city over the last 50 to 60 years, it would be him.

“He was an excellent surgeon and educator, and he was always instrumental in the community and with his church. He was a philanthropist who participated on lots of boards and his opinion was sought out on multiple levels.”

Dr. Farha was born Sept. 20, 1927, in Marjayoun, Lebanon, and came to America in 1950 to attend college and medical school. He founded Wichita Surgical Specialists, P.A. in 1963. It soon became one of the largest independent surgical groups in the nation. He chaired its board until 1998.

He was a founder of the KU School of Medicine-Wichita in 1971, according to school officials, and served as the first chair of the school’s surgery department. He taught there for more than three decades.

In 2013, Dr. Farha was the recipient of the “Man of the Year” award presented by the Antiochian Heritage Foundation. He served as a board member of the International Orthodox Christian Charity.

Among his philanthropy was Wichita State University. “Dr. George was an icon for our community,” said Elizabeth King, president and CEO of the Wichita State University Foundation. “He epitomized what the Great American Dream was all about. And he did it in Wichita, Kansas.”

“He was stern as father, but he was also kind and loving,” said Gayle Malone, one of Dr. Farha’s four daughters. “He was a mentor to us.

“He always said Wichita has been good to him, so he always gave back to Wichita. His gracious nature taught us to be good people.”

Tribute published in The Wichita Eagle

IN MEMORIAM CONTINUED



Mark L. Friedell

1951-2016

Dr. Mark Lowry Friedell, 65, of Orlando, Florida passed away July 10, 2016 in Kansas City, Missouri. He was raised in Newton, Massachusetts, son of Dr. and Mrs. Gilbert Friedell, brother to Anne Lewis, Dr. Benjamin Friedell, James Friedell, and Sarah O'Connell. Dr. Friedell attended Beloit College where he played football and was a member of the SAE fraternity. He attended medical school at the University of Bologna in Bologna, Italy where he met his wife, Donna. They were married on December 30, 1977. Dr. Friedell did his Surgical Residency at the University of Massachusetts and his Vascular Fellowship at Beth Israel Hospital in Newark, New Jersey. His first position was at the Chicago VA Hospital and he was on the faculty at the University of Chicago Medical School. He went on to practice vascular surgery as well as become the Program Director and Academic Chairman of Surgical Education at Orlando Regional Medical Center (ORMC). At the time of his death, Dr. Friedell was the Ralph R. Coffey Professor of Surgery and the Chairman, Department of Surgery at the University of Missouri - Kansas City School of Medicine. Dr. Friedell is past president of the Florida Vascular Society and also past president of the National Association of Program Directors in Surgery (APDS). He also belonged to numerous local and national surgical societies. His life was devoted to the teaching and mentoring of surgical residents and medical colleagues. Among his accomplishments, Dr. Friedell was instrumental in creating the Level 1 Trauma Center at ORMC and the results of his work came to bear during the recent tragedy in Orlando. He is survived by his wife, Donna, and his sons, Nick and Alex Friedell.

Tribute published in The Orlando Sentinel

IN MEMORIAM CONTINUED



Edward M. Greaney

1919-2015

On July 14, 2015, Dr. Edward Michael (Mike) Greaney, Jr. died peacefully in his home. Mike was the only son of Edward Michael and Evelyn Greaney, born on May 28, 1919 in Stamford, Connecticut. He is survived by his children, Mary Ellen Kirst (Bill), Kathleen Delgado (Tony), Michael Greaney (Patty), Patricia Williams (Dick), Gregory Greaney, M.D., (Anne), Margaret Samaniego, (Luis), Elizabeth Phillips, Deirdre Apablaza (John) and Teresa Denison (Michael). Edward is also survived by 26 grandchildren and 16 great-grandchildren.

He was predeceased by his wife, Mary Cavanaugh

Greaney and his daughter Deborah Parker. Mike is a graduate of Fordham University and Jefferson Medical College. He was commissioned a Lieutenant (junior grade) in the United States Navy Medical Corps in March 1943 immediately after graduation from medical school and began his internship at Brooklyn Naval Hospital. After combat training at Camp LeJeune, he was assigned as Battalion Surgeon to the 3rd Battalion (Artillery) of the 12th Marine Regiment, of the Third Marine Division. He participated in the Battle of Iwo Jima. During this tumultuous time, he married the love of his life, Mary Cavanaugh in March of 1943, and the first two of their ten children were born during these war years. After concluding his military service in 1947, he completed a residency in general surgery at the Long Beach Veterans' Hospital in 1951. Dr. Greaney started private practice in general and pediatric surgery and enjoyed a long and distinguished surgical career. He spent the majority of his practice at St. Joseph Medical Center in Burbank, where he eventually became Chief of Staff in 1962. Dr. Greaney was an adjunct clinical professor at LA County USC Medical Center in the Dept. of Surgery until his retirement in 1989, attaining emeritus status and an honorary lifetime membership in the Society of Graduate Surgeons. He was a Fellow of the American College of Surgeons entering in 1953, and was also a Governor of the College. Among his honors and accomplishments were: President of The Southern Californian Chapter of the American College of Surgeons; President of USC Professional Staff Association; member of Pacific Coast Surgical Association, Western Surgical Association, Society of Surgery in the Alimentary Tract and Los Angeles Surgical Society. He was beloved and respected by the countless patients he treated as well the physicians and nurses with whom he worked over nearly 40 years of surgical practice. Edward and Mary settled in the San Fernando Valley and were members of St. Francis de Sales Parish, where all the children attended school. They were founding members of the Catholic Physicians Guild and the Right to Life League. Mike was a long-time member of Lakeside Golf Club where he enjoyed playing golf and made many life-long friends. After he retired, Mike and Mary moved to their home on Beach Road in Capistrano. In 2001, they moved to Pasadena to be closer to their children and grandchildren.

Tribute by Legacy.com

IN MEMORIAM CONTINUED



Carlos Grodsinsky

1931-2016

Grosse Pointe Park resident Carlos Grodsinsky Sr. M.D., 84, died Friday, May 27, 2016, in Hemlock, Michigan. He was born Oct. 12, 1931, in Buenos Aires, Argentina, to Mauricio and Alicia Grodsinsky. He graduated from the University of Buenos Aires in 1957, earning his medical degree with a Ph.D. in surgery. He also earned a medical degree from the University of Michigan in 1962. Dr. Grodsinsky was a general surgeon and Head of Division 5B at Henry Ford Hospital. He also was the Department of Surgery Chief at HFH Fairlane Clinic in Dearborn. He was a member of the Colon and Rectal Surgical Association, American College of Surgeons, Western Surgical Association and International Surgical Association.

He enjoyed sailing.

Dr. Grodsinsky is survived by his wife, Susana Reffo-Grodsinsky; sons, Carlos Grodsinsky Jr. (Helene Arial) and Gustavo Grodsinsky (Dawn Gooley); daughter, Maria Grodsinsky-Healy (Jay Healy) and grandchildren, Conrad Healy, Belen Healy, Alicia Healy, Sophie Grodsinsky, Sierra Grodsinsky and Sydney Grodsinsky. In addition to his parents, he was predeceased by his sister, Sophie Lopez-Isnardi.

Tribute by Legacy.com

IN MEMORIAM CONTINUED



Jay L. Grosfeld, MD

1935 – 2016

Lafayette F. Page Professor and Chairman Emeritus;
Department of Surgery, Indiana University School of
Medicine; Indianapolis, Indiana

Born in New York City on May 30, 1935, Dr. Jay L. Grosfeld attended undergraduate school at the Washington Square College at New York University (NYU) where he received a B.S. in Biology and a B.A. in History. He attended medical school at the New York University School of Medicine from 1957-1961.

He trained in General Surgery at NYU and Bellevue

Hospitals from 1961-1966. After serving two years as a Captain in the U.S. Army Medical Corps (1966-1968), he trained in Pediatric Surgery at the Nationwide Children's Hospital at Ohio State University from 1968 to 1970. He returned to NYU as Assistant Professor of Surgery in 1970. In 1972, Dr. Grosfeld was appointed Professor and Director of Pediatric Surgery at Indiana University and the first Surgeon-in-Chief of the Riley Children's Hospital in Indianapolis, IN. He pioneered the development of pediatric surgery in the state and set the standard for the surgical care of infants and children. In 1985 he was appointed Chairman of the Department of Surgery at Indiana University School of Medicine, the first pediatric surgeon in the USA so honored. He developed excellent training programs and was a role model for his trainees. He served the University and the children of Indiana well for more than 40 years. In 2003, Dr. Grosfeld stepped down from the Chair of Surgery at Indiana University after serving 19 years in that capacity. His tenure was marked by developing new clinical programs and research facilities, the center for surgical technology, providing high quality clinical care and significantly growing the Department of Surgery from 22 to 70 faculty members.

Dr. Grosfeld was recognized as an outstanding clinician, master surgeon, inspiring teacher, talented administrator, innovative scientific investigator, surgical leader and a staunch advocate for children. He has won numerous teaching awards at I.U. including the prestigious President's Award. He was extremely productive and published 491 scientific articles in peer-reviewed journals, 135 book chapters and nine textbooks. Dr. Grosfeld is best known for his expertise in neonatal surgery, pediatric surgical oncology and surgical education.

He served as Secretary and Chairman of the Surgical Section of the American Academy of Pediatrics, President of the American Pediatric Surgical Association, President of the Halsted Society and was the only pediatric surgeon to serve as Chairman of the American Board of Surgery. He served as President of both the Central Surgical Association and the Western Surgical Association, President of the World Federation of Associations of Pediatric Surgeons (WOFAPS), President of the American Surgical Association, as a

IN MEMORIAM CONTINUED

Governor and member of the Advisory Councils for both General Surgery and Pediatric Surgery and other Committees of the American College of Surgeons, later becoming First Vice-President, and also served as Council Member of the British Association of Pediatric Surgeons. He has been selected for Who's Who in America in 5 separate categories and America's Best Doctors.

He was awarded the Denis Browne Gold Medal by the British Association of Pediatric Surgeons in 1998 and was named Pediatric Surgeon of the Year at the University of Graz, Austria in 2000. In 2002, he received the William E. Ladd Medal from the American Academy of Pediatrics, the highest honor bestowed on a pediatric surgeon in America. In 2002 he also received the Sagamore of the Wabash Award from the late Governor of Indiana Frank O' Bannon for his outstanding service to the State. Dr. Grosfeld was awarded the Fritz Rehbein Medal from the European Pediatric Surgical Association in 2011. Dr. Grosfeld lectured extensively, both nationally and internationally and was elected an honorary member of 15 international surgical societies including an Honorary Fellowship in the Royal College of Surgeons of both England and Ireland, as well as the Royal College of Physicians and Surgeons of Glasgow. He was awarded the prestigious Solomon A. Berson Medical Alumni Achievement Award in Clinical Science from New York University. Dr. Grosfeld served as Director of Pediatric Surgery and Surgeon-in-Chief of Riley Children's Hospital in Indianapolis for 33 years and developed one of the top pediatric surgery training programs in the country. He was Editor-in-Chief of the Journal of Pediatric Surgery, Seminars in Pediatric Surgery, and the renowned two-volume textbook Pediatric Surgery. He was Co-editor of Surgery of Childhood Tumors. He was Chairman of the Board of Directors of the APSA Foundation, Secretary-Treasurer of the International Society of Surgery Foundation and Vice-President of the American Surgical Association Foundation. Dr. Grosfeld was influential in the development of the WOFAPS Foundation and served as its first president.

Dr. Grosfeld's greatest legacy is his family. He was happily married to his devoted wife Margie for the past 54 years and together they have set a standard for a successful and close family life. Dr Grosfeld was the son of Louis and Pearl (Reizes) Grosfeld. He is survived by his wife Margie (Faulkner); his sister, Claire (Bernie) Zucker; his children, Alicia (Bruce) Thorne, Dalia (Jean-Philippe) Maheu, Janice (Martin) Kaefer, Jeffrey (Deborah) Grosfeld, and Mark Grosfeld; and 17 grandchildren.

He was buried in a private ceremony by his family in Crown Hill Cemetery. Information on a memorial service will be forthcoming.

Dr. Grosfeld will be greatly missed by all who had the privilege, pleasure and honor of knowing this kind, caring and loving man.

Published in the The Indianapolis Star

IN MEMORIAM CONTINUED



James C. Gruenberg

1942-2016

Dr. James Gruenberg, 73, passed away February 2, 2016 at his home. Born March 22, 1942 in Chicago, IL, Jim graduated from Glenbard West H.S and was awarded degrees at Stanford University and University of Michigan Medical School. He was a US Army Major, serving as the Chief of Surgery at the 95th Evacuation Hospital in Da Nang, South Vietnam. After serving his country, Jim worked as Staff Surgeon (Henry Ford Hospital), Assistant Professor/Professor of Surgery (University of Michigan, Michigan State University College of Human Medicine), Director of Surgery (Saginaw Cooperative Hospitals Inc.). His passion was having a close teaching relationship with each resident, instilling the importance of research and his love of working with patients. Jim's other passion was playing duplicate bridge. A member of the Saginaw, Midland, Bay City Bridge Unit 200, he recently received the Life Achievement award. He treasured his Unit 200 bridge partners and his friends in the Saginaw Country Club bridge group. Jim is preceded in death by his parents, Robert P. and Imogene (Chandler) Gruenberg, and first wife Jennifer Klein. He is survived by his wife of 27 years, Dianne Loyd Gruenberg, daughter and son with Jennifer, Heather (George) and Karl (Karen), 4 stepchildren, Joy (Sean), Joel, Jason (Shawn) and Clinton, three grandchildren, Evie, Erik and Ewan, a brother and sister, Peter (Mary Ann) and Imogene (Paul). Honoring Jim's wishes, an anatomical donation to the University of Michigan Medical School was made. Jim was a teacher in life and is now a teacher in death.

Tribute by The Saginaw News

IN MEMORIAM CONTINUED



Paul E. Hodgson

1921-2013

An outstanding general surgeon and surgical educator, Paul Edmund Hodgson died on 28 August 2013, age 91, at the University of Nebraska Medical Center, Omaha, Nebraska.

Born in Milwaukee, Wisconsin on 14 December 1921, he grew up with a brother and sister, and graduated from Wauwatosa High School in 1939.

He attended Beloit College in Wisconsin for three years, leaving to join the Army Specialized Training Program at the University of Michigan School of Medicine where he graduated (Cum Laude) in 1945. After an internship

at Michigan he served two years as Captain, U.S. Army Medical Corps, in charge of the Surgical Ward at Fitzsimons Army Hospital, Denver, CO.

Returning to Michigan, he completed his surgical residency and joined the faculty, advancing to Associate Professor at the University and the affiliated VA Hospital.

While at Michigan he was a member of Alpha Omega Alpha, Phi Kappa Phi, and the Galens Society.

Dr. Merle M. Musselman recruited him in 1962 as Professor of Surgery at the University of Nebraska where he served as Shackelford Professor of Surgery, Assistant Dean for Academic Affairs, and Chairman of the Department of Surgery 1972-1984.

Always central to Paul's life was home and family. Home was a comfortable house in Omaha with a tri-level back yard. Immediate to the house was a flat back yard populated by numerous bird feeders and a great number of birds of all flavors and plenty of squirrels to pick up the spills. The second level was a steep hill planted with assorted shrubs and trees to prevent erosion rising to the top level plateau, which afforded a space for gardening and (later) beekeeping. Lucky friends might receive a jar of Hodgson's Honey.

Family was Barbara Jean Osborne, known to many as Oz, whom he met at Beloit, daughter Ann and son Paul C. Family vacations featuring birding and wildlife involved camping and exploring out of the way sites in the western U. S., which sparked life-long dedication to conservation for the whole family. Dr. Hodgson served for many years on the Board of Trustees of Beloit College and as Class Representative, and he loved attending the annual reunions, where he proudly paraded representing the Class of '43, although he received his B. S. diploma in 1990, retroactive to 1943, 47 years after he left to commence his medical training through the Army's accelerated training program. He was a 50-year member of the Dundee Presbyterian Church and served as Deacon and Elder. Barbara shared his interests in service to community and conservation. She died in 2010 after 65 years of marriage. He is survived by his daughter Ann B. Hodgson, Ph. D., an ecologist, and son Paul C. Hodgson, a computer analyst with the combined city-county Douglas-Omaha Technology Commission.

IN MEMORIAM CONTINUED

Paul belonged to virtually every major surgical organization at the local, state and national level and to the Société Internationale de Chirurgie.

Several of the organizations deserve special mention. He revered his mentor Frederick A. Collier and was President of the Collier Society 1989-1990. He served on numerous committees for the American College of Surgeons (Fiscal Affairs, Surgical Education, SESAP (1973-1988), Cancer) and was President of the Nebraska Chapter 1985-1987.

Paul wrote 44 published papers. Early residency papers addressed basic problems but later ones were directed to his long interest in surgical education.

Special mention should be made of the Western Surgical Association. A long time member, Paul served as Secretary from 1976-1980 and President in 1981. Paul had a special affection for the excellent clinical programs and the special good fellowship of the social events and on banquet nights he and Oz were early on the dance floor and late to leave.

Dr. Paul Hodgson was a superb surgeon who could perform almost any operation. His surgical skill, patience, attention to detail and caring manner endeared him to his patients. Beyond being a skilled surgeon, he was a patient and tireless teacher of surgery. His love for residency education was really important to him. He influenced legions of medical students, surgical trainees, and fellow surgeons, and helped bring UNMC's surgical education program to its current status and national reputation.

Paul's influence on the University of Nebraska's surgical program was prodigious. Many of his residents practice surgery in Nebraska and neighboring states, others are more widespread. He taught them how to operate, when to operate and when not to operate.

He was named an honorary alumnus of the College of Medicine in 1985. He retired in 1988, becoming an emeritus professor of surgery. At his retirement in 1988, the Paul E. Hodgson MD Lectureship in Surgical Education was established in his honor in the Department of Surgery at the University of Nebraska Medical Center. In 2006, Dr. Hodgson was named one of the Nebraska Medical Center's "Legends", an honor awarded to retired physicians who have demonstrated remarkable leadership, professionalism and friendship. Dr. Hodgson had a vision for UNMC to be on the cutting edge of general surgery training methods – a vision that was realized posthumously through his major gift, an endoscopy training simulator purchased through the Paul E. Hodgson, M.D. Innovations in Surgery Education Fund, established to celebrate his legacy through the University of Nebraska Foundation. At its dedication, UNMC presented to his children a posthumous College of Medicine Holyoke Society Award to honor his generous contribution.

And so passes a legendary figure in surgery, dedicated to surgical education, a family man with a love of the outdoors, a true gentleman and friend to all.

Tribute written by Alan R. Hopeman, M.D.

IN MEMORIAM CONTINUED



W. S. Lorimer, Jr.

1919-2016

W.S. Lorimer Jr., "Bill" Lorimer passed away from congestive heart failure in Fort Worth, Texas January 9, 2016 at the age of 96.

His wife of 53 years, Margaret Deutsch "Dede" Lorimer preceded him in death in 1997. Together they had 9 children and 26 grandchildren (which may have been why she preceded him in death 19 years ago!) He enjoyed the company of 14 additional great grandchildren before his death.

He not only college educated his 9 children but set up an educational trust that eventually helped fund the college education of 20 of his 26 grandchildren with money to

spare now for his great grandchildren. He was generous to a fault.

He grew up in Fort Worth, Texas, the son of a general practitioner, W.S. Lorimer Sr. who had moved to Fort Worth in 1913. Dad graduated from the University of Texas and then attended the University of Texas Medical Branch in Galveston for one year before being accepted to Northwestern University Medical School (where his father had attended medical school). He then completed his internship and residency at The Cook County Hospital during which time he met our mother on a blind date. They married in 1944. They eventually moved to Fort Worth in 1948 where he set up practice with his father and a childhood friend, Warren Moorman MD.

Dr. Lorimer accomplished many "firsts" as a Fort Worth surgeon. He was the first in Fort Worth to do a carotid endarterectomy, pelvic exenteration, "commando" procedure and separated a set of parasitic Siamese twins.

He accumulated numerous honors and positions in surgery including: chief of surgery and staff at John Peter Smith Hospital and Saint Joseph Hospital, membership in the Southern Surgical and Western Surgical Associations, Governor of the American College of Surgeons, examiner for the American Board of Surgery, President of the Southern Society of Clinical Surgeons, Treasurer and President of the Texas Surgical Society and winner of the Gold Headed Cane Award, the highest honor bestowed on a Tarrant County physician, voted on by his peers as the "Doctor's Doctor".

He performed surgery until 1989 at which time he accepted the position of medical director of Texas Community Hospice. He became quite interested in the subjects of dying and death. Ironically, he became one of their patients in the days preceding his death. He was alert to the end, working a New York Times crossword 3 days prior to his death. He made a call to his UBS broker and made a trade that same day. His beverage of choice during his hospice stay was a cup of coffee with 1 or 2 shots of Bailey's!

He felt that his death should be a learning experience for his children. He really didn't want to die but he realized too that there was nothing more we could do for his failing heart. During his last several hours, he was quite short of breath and was having a hard time letting go saying "this letting go is much easier said than done". I asked him if he was in pain and he said "No". I asked him if he was afraid and again he answered "No". He said "I am in mental anguish and I feel like a drowning man"

During the final hours when the available family had been called to attend, he had long periods of apnea and the brief periods of hyperventilation. He suddenly awoke after one of these apneic spells and declared "I'm Cheyne Stokes breathing". I was astounded, the hospice nurse laughed and all realized what incredible insight he had to the end.

Tribute by Douglas D. Lorimer MD (Son)

IN MEMORIAM CONTINUED



Frank G. Moody 1928-2016

Frank G. Moody died 12 August 2016 while vacationing in Sweden.

Frank was born 3 May 1928 in Franklin, New Hampshire. He graduated from Phillips Exeter Academy in 1946. Following two years spent as a paratrooper in the United States Army, he matriculated to Dartmouth College in 1948. There, he was a member of the $\Psi\Upsilon$ social fraternity and captain of the ski team. Following another two years in the Army, he attended Cornell University Medical College earning his M.D. in 1956. His surgical training was at New York Hospital, Cornell Medical Center under the direction of Dr. Frank Glenn. After completing his surgical residency in 1963, he served as an advanced research fellow studying diseases of the stomach and

biliary tract at the University of California Medical School, San Francisco under the direction of Dr. J. Englebert Dunphy. In 1963, he became the Chief of the Division of Gastrointestinal Surgery in the Department of Surgery led by Dr. John Kirklin at the University of Alabama, Birmingham. Dr. Moody rapidly rose through the ranks and became a Professor of Surgery at UAB in 1969. In 1971, at the age of 43, he became Professor and Chairman of the Department of Surgery of the University of Utah. Eleven years later he was recruited to Houston, Texas as the Denton A. Cooley Professor and Chairman at the University of Texas Medical School at Houston. Although he stepped down from the Chair in 1994, he remained a Professor of Surgery at UT Houston until his death.

Dr. Moody's research was continuously funded by the NIH from 1967-2009. He made seminal contributions in the physiology of gastric acid secretion, gastric ulcerogenesis and multiple organ failure. He was a member of multiple NIH Study Sections. He was a member of more than 40 national and international surgical societies and served as President of the American Pancreatic Association, the Collegium International Chirurgie Digestivae United States Section, the International Biliary Association, the Societe Internationale de Chirurgie U.S. Section, the Society of Surgical Chairmen, the Society for Surgery of the Alimentary Tract (SSAT), the Salt Lake City Surgical Society and the Utah Chapter of the American College of Surgeons. He served as a Director of the American Board of Surgery from 1972-1978 and served on the Executive Committee of the American Board of Medical Specialties. He served on the Executive Committee of the Association of American Medical Colleges and on the Liaison Committee on Graduate Medical Education.

Frank Moody delivered more than forty named lectures and was author of 155 original papers in refereed journals. In addition, he published 43 invited articles, wrote 100 book chapters and edited or authored more than 25 books. Of the latter, he was most proud of his autobiography, *Frank Reflections*, published in 2013. Frank continued to attend national and international surgical meetings, regularly making erudite comments about the content of lectures, until just weeks before his death.

Among the many honors he received were $\Phi\beta\kappa$, $\Lambda\Omega\Lambda$, The Houston Surgical Society Distinguished Houston Surgeon, the Founders' Medal of the SSAT, the International College of Surgeons Master Surgeon Medallion, The Distinguished Service Award of the International Hepato-Pancreato-Biliary Association, the Lifetime Achievement Award of the Society of University Surgeons and the American Surgical Association Medallion for the Advancement of Surgical Care. His contributions to GI surgery are recognized by the "Maja and Frank G. Moody State of the Art Lecture" delivered annually at the SSAT meeting.

Dr. Moody was known for his intelligence, incisive questions, quick wit, charm and warmth. Frank loved the mountains, particularly the Wasatch Front, and was a passionate skier and hiker. He will live on through the hundreds of individuals whom he trained and/or mentored and who have gone on to make their own contributions to surgery.

Dr. Moody is survived by his three children, Anne, Frank and Jane and by his loving companion Inger Arden.

Tribute provided by John Potts, M.D.

IN MEMORIAM CONTINUED



William B. Rydell, Jr.

1931-2015

It is with sadness in our hearts that we mourn the passing of William (Bill) Birger Rydell, Jr. He was born on June 22, 1931 in Rice Lake, Wisconsin, the son of William Birger Rydell, Sr. and Helen Bullard Rydell, baby brother to Caroly Rydell Murray. He lived his childhood years in the idyllic woods of Wisconsin. He survived a childhood bout of polio, was introduced by his mother to birding, learned to play golf, collect stamps, and appreciated many intellectual pursuits. He moved with his mother to Brookline, Mass when his parents divorced, graduating from high school at Brookline High in 1949. He completed his undergraduate studies at Harvard College, graduating in 1953. While at Harvard, he met his first wife, Barbara Botsford. They married in Wellesley, Mass in 1952.

After graduation from Harvard, Bill and Barbara moved to Chicago so he could attend Northwestern Medical School. Bill was an accomplished medical student, inducted into the Alpha Omega Alpha medical honor society. While in Chicago, 2 sons, William Birger III and James were born. The young family then moved to Hanover, NH for completion of Bill's surgical residency at Dartmouth-Hitchcock Memorial Hospital. Residency was interrupted by the US Air Force, serving 2 years at Beale AFB in Marysville, CA. Daughter Gale was born while in Hanover.

After residency completion, the best opportunity for surgical practice presented itself in Las Vegas, NV. Another cross-country move ensued. Bill was an accomplished surgeon and member of the medical community during his 26 years of surgical practice. He became a Fellow of the American College of Surgeons. He enjoyed a surgical partnership with Douglas Miller, MD, then solo practice, then formed General Surgical Associates with Drs. Colquitt and Banich, later adding Drs. Yeaton and McBride. During his years in Las Vegas, he was a member of Southwest Rotary Club, serving as president. Additionally, he was president of the Clark County Medical Society and the Nevada Chapter of the American College of Surgeons. He was elected into the prestigious Western Surgical Association in 1980. He actively served as mentor for surgical residents and medical students at the University of Nevada School of Medicine. Always the surgical personality, he was tough, decisive, and acted with conviction.

Bill and Barbara divorced in 1975, and he married Mary Wallstead the same year in Coronado, CA. They enjoyed spending much of their free time in Coronado until 2011, when increased health concerns necessitated the sale of their beach condominium. Bill and Mary have travelled extensively, to all corners of the earth, mostly in pursuit of birds, which are often located near sewage pools, garbage dumps, and individual backyard feeders. Bill retired from his surgical practice in 1990, and he and Mary relocated to Pebble Beach, CA in 1991, where they remained until 2012. The year of 1992 Bill devoted to birding, publishing a book detailing his pursuit. During that year he added 714 North American bird species to his ABA list, flew 194 flight segments, landed at 52 different airports, covered 35,000 miles, spent 23 days at sea on pelagic trips, and wore through a pair of hiking boots, enjoying every minute of it.

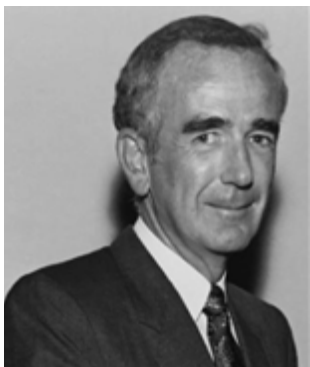
While in Pebble Beach, Bill and Mary enjoyed the forest, the ocean, the mild climate, the golf, and their friendships. They hosted family celebrations for holidays, and Bill's 70th and 80th birthdays were large gatherings with friends and relatives who traveled from afar to enjoy the festivities. Declining health brought them north to Oregon, to be closer to the help of family in 2012. He enjoyed his time at retirement communities in Oregon, and especially enjoyed time spent with family.

Bill will always be remembered as a meticulous surgeon and a shrewd planner of life. Though his sharp mind and keen memory declined over the past few years, his unending dry wit and generous support of family continued until his last days. His final exit was rapid, and we thank the hospital staff at St Vincent's Hospital for their compassion and professionalism. He coincidentally left this world on the same day that his father departed 36 years prior, November 24.

He is survived by his wife, Mary, sisters Caroly and Cynthia, brother Peter, niece and nephew, his children, William III (Karen), James and Gale, 7 grandchildren and one great granddaughter.

Tribute published by Dignity Memorial

IN MEMORIAM CONTINUED



Norman W. Thompson 1932-2015

Dr. Norman Winslow Thompson, a pioneer in endocrine surgery, died peacefully at home surrounded by members of his family on Tuesday, November 17, 2015 in Ann Arbor, Michigan at the age of 83. Dr. Thompson had a long and distinguished career in medicine and trained, mentored and influenced generations of surgeons around the world. He was born in Boston, Massachusetts, in 1932 and graduated from high school in Somerville, New Jersey, in 1949. He received his B.A. degree from Hope College in 1953 and his M.D. degree from the University of Michigan Medical School in Ann Arbor in 1957. After serving his internship and residency in general surgery at

the University of Michigan, he was appointed to the faculty as an Instructor in 1962. He was promoted to Assistant Professor in 1964, Associate Professor in 1966 and Professor in 1971. He was subsequently appointed the first Henry King Ransom Endowed Professor of Surgery in 1979 for the duration of his academic career. Despite opportunities to take leadership positions elsewhere, Norman devotedly spent his entire career in Ann Arbor. Although his clinical interests were inclusive of the general fields of general and vascular surgery, he became focused on surgical diseases of the endocrine glands. Dr. Thompson was the author or co-author of nearly 300 scientific papers, 94 book chapters and editor of several books and 12 surgical films. He was an invited lecturer or visiting Professor of Surgery on 484 occasions at 135 institutions across 5 continents. Dr. Thompson was an active, participating and founding member of many professional organizations and received numerous awards including an honorary PhD from the University of Linköping, Sweden. Dr. Thompson was a beloved teacher of surgery at the University of Michigan and helped to train over 265 chief residents in surgery. His approachability, empathy and clarity of explanation endeared him to patients and surgeons. He was appointed Professor Emeritus of Surgery on his retirement in 2001. At that time, the University of Michigan established the Norman W. Thompson endowed Professorship of Endocrine Surgery. The Department of Surgery also initiated a Norman W. Thompson Fellowship in Endocrine Surgery, which has been filled on a competitive basis each year since. Norman was a true renaissance man, enjoying art, nature, literature, history, music, stimulating conversation, international fare, an aged Scotch and a fine wine. He also played tennis and golf, delighted in gardening and drawing, was an avid fan of Michigan football and basketball, and found peace at the sand dunes of Lake Michigan. Throughout his life, Norman was engaged in mastering the art of living. Norman is survived by his wife of 59 years, Marcia Ann Veldman Thompson of Ann Arbor, Michigan; son and daughter-in-law Robert Winslow Thompson and Michelle Ann Conlon of Richmond Heights, Missouri; daughter and son-in-law Karen Louise Thompson and John T. VerHeek of Ann Arbor; daughter and son-in-law Susan Margaret Thompson-Doering and Jeffrey Allen Doering of Canton, Michigan; and daughter Jennifer Elizabeth Thompson McGuffin of Gilbert, Arizona. He leaves behind five grandchildren, Samuel Adam McGuffin, Jacob James McGuffin, Andrew James Neevel, Taylor Alexandra Thompson, Katrina Hope McGuffin, also three step-grandchildren, Nathaniel Alexander VerHeek, Joshua Allen Doering and Zachary Lee Doering.

Tribute published in The Ann Arbor News

IN MEMORIAM CONTINUED

Nicholas Wetzel

1920-2015

Nicholas Clarence Wetzel, Jr. a resident of Evanston, IL for 60 year passed away in his home surrounded by his children and caregiver.

Living long is a privilege; living well is by design: To do both is a rare, laudable and remarkable accomplishment. Nick managed to do both. He was a Father, Husband, devout Catholic, Scholar, Researcher, Sportsman, Athlete, and most importantly in service to his fellow man as a good and noble Physician. He was a man of consummate decency throughout his life; he invariably did more for others than for himself. His devotion to his Principles, Family and Profession remained with him to the end.

Born in Jacksonville, FL on July 17, 1920 to Gertrude and Nicholas Wetzel, Nick was raised in Waukegan, IL and graduated from Lake Forest Academy in 1938. He graduated from Princeton University in 1942, and attended Northwestern University Medical School where he received his MB (1945), MD (1946), MS (1950), and PhD (1956).

Nick was an adventurer and avid mountain climber, scaling the peaks of the Matterhorn in Switzerland (1958), the Grand Tetons (1961), was one of the first 125 climbers to summit Mt. McKinley (1962), Mt. Fuji in Japan (1965), and four ascents up the east face of Longs Peak (1959-63).

Nick also attended the opera since high school and was a longtime subscriber to the Lyric Opera. He was an ardent bibliophile, collecting many first edition novels. His wonderful woodworking skills were prized possessions. Another lifelong passion of Nick's was education. He supported many in their pursuit of higher education.

He had a lifelong love for the camera that began during his college days as the Photographic Editor of The Daily Princetonian. Nick spent a great deal of time developing his own film and enjoyed making movies of his family and world travels.

Nick cherished chasing the elusive bonefish and tarpon with his fly rod in the Florida Keys and Bahamas and later became an expert fly tier. He won a Miami Herald fishing tournament with a 125 lb. tarpon that took over three hours to land on his fly rod. That shoulder bothered him quite a bit later in life.

Perhaps, his greatest love was for his remote and rustic cabins in the Upper Peninsula of Michigan; it brought his family together. His dinnertime stories were marvelous recounts of his past adventures. Nick spent his summers musky and trout fishing and in the fall deer and bird hunting. The maintenance of such also led him to become an accomplished carpenter, plumber, and electrician.

He was a Medical Officer with the U.S. Naval Reserves (1945 – 1947) which included

IN MEMORIAM CONTINUED

Internships at Naval Hospitals in San Diego, Guam and Truk islands. He completed his Residency in General Surgery at Passavant Memorial Hospital (1948 – 1949); his Fellowship in Neurological Surgery at Northwestern Medical School (1949 – 1952); He was the Attending Surgeon – Northwestern Memorial Hospital, Chief Neurological Surgeon (1976 – 1987); Neurological Surgeon, U.S. VA Research Hospital Lakeside (1959 – 1987); He joined the faculty of Northwestern Medical School in 1952, and was Professor of Surgery (1976 – 1989), Emeritus (1989); He also was the Chief of Neurological Surgery, VA, Lakeside Medical Center (1976 – 1988); Associate Editor of Surgery, Gynecology and Obstetrics for over thirty years. He ran the neurological service of the VA Lakeside Hospital for most of its existence, and it became the model for other academic medical centers.

His Partners in private practice included Loyal Davis, Chicago's first neurosurgeon, and Daniel Ruge, President Reagan's personal physician during his first term.

He was a Member of the University Club – Chicago since 1954, the North American Racquet Association, the Federation of Fly Fisherman and the National Rifle Association. He had memberships with the American Medical Association, a fellow with the American College of Surgeons, Harvey Cushing Society, Western Surgical Association, American Association for Advancement of Science, Chicago Surgical Society, Chicago Neurological Society, Sigma XI, and Society of Medical History of Chicago. Medical Officer with the U.S. Naval Reserve (1945 – 1947)

He is survived by his loving wife Helen of almost 70 years; his children Mari Quick (Tom), Nicholas III, Paul (Trish), Susan Fackler (Mark), Sara, Laine Hoffman (Skip), Peter, Richard (Karen), and Stephen (Patrice); his grandchildren Suzanne Prochazka, Rosanne Urbik (Jerry), Sam Quick (Ann), Katie Quick, Nicky Wetzel, Brian Wetzel, Cynthia Wetzel, Alanna Yeargain (Joe), Brenna Wilson, Tim Kostner, Emily Kemmelung (Alex), Everett Wood, Madelaine Wood, Greta Wetzel, Ava Wetzel, and Max Wetzel; and his great-grandchildren Natalie and Avery Prochazka, Amelia and Mallory Urbik, Owen Yeargain, and Mackinzie Wetzel. He is also survived by his sister Mary Klingensmith.

Tribute provided by Donnellan Funeral Home

IN MEMORIAM CONTINUED



John H. Wulsin

1920-2014

John H. Wulsin, 94, husband and, father, surgeon and, horseman, died at his home in the company of his family on July 20, 2014. Born and raised in Cincinnati, the third of seven children of Lucien and Margaret Wulsin, he decided as a young boy to become a doctor instead of working in the family business, the Baldwin Piano Company. He attended Cincinnati Country Day School, Le Rosey, the St George's School in Newport Rhode Island, Harvard College, and graduated from The University of Rochester School of Medicine and Dentistry in 1944. After marrying Rosamond Foster Reed in 1942 at Calvary Episcopal Church, he served

as a medical officer in World War II 1945-46 on the USS LST 243 and at the USMC 5th Service Depot in Guam. During the Korean War from 1953-54 he was stationed at the US Naval Hospital in Yokosuka, Japan, living in nearby Yokohama with his wife and three children. He attained the rank of Captain in the US Naval Reserves. After completing his residency in surgery at the Cincinnati General Hospital, 1947-56, and a research fellowship at Massachusetts General Hospital in 1958, he served on the faculty of the Department of Surgery, University of Cincinnati, until his retirement in 1985, working primarily as a general surgeon at the Cincinnati General Hospital, Holmes Hospital, the Veterans Administration Hospital, and Christ Hospital. He served for 20 years on the UC College of Medicine Admissions Committee, including three years as chair.

For 61 years he was married to Rosamond, the mother of his five children, and was her sole caretaker in the final years before she died in 2003. In 2005 he married Anne Durant Sanger, of Bozrah, Connecticut. He is survived by his wife, his children John, Jr (Spring Valley, NY), Lawson (Cincinnati), Drausin (Cynthiana, OH), Reed (South Amherst, MA), and Stockton (Cincinnati), 13 grandchildren, three great-grandchildren, and two sisters, Peggy Kite (Cincinnati) and Betsy Bennett (Vancouver, BC). As a boy he often spent Sundays riding long hours with his father on Indian Hill trails. In 1957 he moved to Indian Hill where he tended to his stable of horses for the next forty years. For most of his adult life he rode regularly with the Camargo Hunt Club, as whip and later as Master. In his spare time, he built tables, desks, and shelves in his basement shop, always as gifts, often carving the recipient's initials. As a long-time member and regular attendee of The Literary Club, he presented over 25 papers there.

Published in The Cincinnati Enquirer

IN MEMORIAM CONTINUED



Nora Christine “NONIE” Lowry

WSA Director - Association Management

June 7, 1967 – April 9, 2016

With great sadness we learned that Nonie Lowry recently passed away after a heroic battle with breast cancer. For everyone who knew her, you know that heaven is about to become a lot more organized!

LP etc strongly and proudly continues Nonie’s legacy and the important work of the WSA, led by Marjorie Malia and Jill Willhite.

She touched many lives...
what a loss!

—*Steven Stain,*
WSA 2014 President

“Nonie was known as a wonderful and selfless leader who was tragically taken in the prime of her life. We were so fortunate to have known her.”

—*Dr. William Chapman, WSA 2015 President*

Nonie will be missed by all. Hard to imagine a meeting without her.

—*Anton Bilchik*

She touched many lives and
she will be greatly missed.

—*Mark Talamonti*

We are deeply saddened by this news. Please extend our sympathy to her family and friends.

—*Jean Nicolas Vauthey*

I am so very very saddened to
hear about the loss of Nonie.

—*Gregory Jurkovich,*
WSA 2011 President

My thoughts and prayers go out to Nonie’s extended family. She was such an upbeat, humble, and courageous human being. Nonie was a class act. We will miss her greatly, but we will hang on to the fantastic memories she helped facilitate.

—*David Farley*

Sad news today... Life is too short.
Spend time on what matters most —
friends & family RIP Nonie

—*Anees Chagpar*

Tragic news. I can’t imagine not seeing her welcoming smile at our next surgical meeting.

—*C. Max Schmidt*

*****If there are any corrections you wish to be made in your listing please complete the following form, cut out and fax to the WSA at 913-273-1140 or email desired changes to: wsa@lp-etc.com**

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