

SURGERY

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SOCIETY OF UNIVERSITY SURGEONS

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David J. Hackam, MD, PhD, *Baltimore, MD*

HEPATOBIILIARY

- 323 **The impact of resident involvement on surgical outcomes among patients undergoing hepatic and pancreatic resections**

Aslam Ejaz, MD, MPH, Gaya Spolverato, MD, Yuhree Kim, MD, MPH, Christopher L. Wolfgang, MD, PhD, Kenzo Hirose, MD, Matthew Weiss, MD, Martin A. Makary, MD, and Timothy M. Pawlik, MD, MPH, PhD, FACS, *Chicago, IL, and Baltimore, MD*

Although resident participation resulted in slightly longer operative times and a modest increase in overall complications after pancreatic resection, other metrics such as duration of stay, major morbidity, and mortality were unaffected.

- 331 **Oncolytic gene therapy with recombinant vaccinia strain GLV-2b372 efficiently kills hepatocellular carcinoma**

Justin W. Ady, MD, Clark Johnsen, BFA, Kelly Mojica, BS, Jacqueline Heffner, Damon Love, PhD, Amudhan Pugalanthi, MD, Laurence J. Belin, MD, MPH, Nanhai G. Chen, PhD, Yong A. Yu, PhD, Aladar A. Szalay, PhD, and Yuman Fong, MD, FACS, *New York, NY, San Diego and Duarte, CA, and Würzburg, Germany*

We demonstrate the oncolytic effect of vaccinia virus GLV-2b372 in the treatment of HCC. The significance of this finding is that HCC can be effectively treated with GLV-2b372.

- 339 **Net health benefit of hepatic resection versus intraarterial therapies for neuroendocrine liver metastases: A Markov decision model**

Gaya Spolverato, MD, Alessandro Vitale, MD, PhD, Aslam Ejaz, MD, Yuhree Kim, MD, MPH, David Cosgrove, MD, Todd Schlacter, MD, Jean-Francois Geschwind, MD, and Timothy M. Pawlik, MD, MPH, PhD, FACS, *Baltimore, MD, and Padova, Italy*

A Markov model demonstrated that HR was the preferred strategy among patients with symptomatic NELM, regardless of hepatic disease burden. In contrast, IAT should be preferred for patients with large nonfunctioning/asymptomatic NELM.

- 349 **Transplantation of human stem cell-derived hepatocytes in an animal model of acute liver failure**

Rajesh Ramanathan, MD, Giuseppe Pettinato, PhD, John T. Beeston, RN, David D. Lee, MD, Xuejun Wen, MD, PhD, Martin J. Mangino, PhD, and Robert A. Fisher, MD, *Richmond, VA, Jacksonville, FL, and Boston, MA*

Transplantation of stem cell-derived hepatocytes into rats with liver failure resulted in better survival and longer function with EC coculture. The significance of this report is that cell transplantation may improve survival and engraftment.

- 360 **Preoperative platelet to lymphocyte ratio predicts outcome of patients with pancreatic ductal adenocarcinoma after pancreatic resection**

Yoshihiro Shirai, MD, Hiroaki Shiba, MD, PhD, Taro Sakamoto, MD, Takashi Horiuchi, MD, Koichiro Haruki, MD, PhD, Yuki Fujiwara, MD, PhD, Yasuro Futagawa, MD, PhD, Toya Ohashi, MD, PhD, and Katsuhiko Yanaga, MD, PhD, *Tokyo, Japan*

The preoperative PLR is an independent predictor in DFS and OS in patients with

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pancreatic ductal adenocarcinoma. The importance of this finding is the usefulness of PLR and its correlation with DFS.

- 366 **Hospital-level resource use by the oldest-old for pancreaticoduodenectomy at high-volume hospitals**
 Russell C. Langan, MD, Chaoyi Zheng, MS, Katherine Harris, PhD, Richard Verstraete, RN, Waddah B. Al-Refaie, MD, FACS, and Lynt B. Johnson, MD, MBA, FACS, *Washington, DC*
 We examined outcomes, resource use, and the cost of PD in cohorts of advancing age. The importance is the potential ability to deliver quality PD care to an aging population without strong associations to increased resource utilization or cost.

- 373 **Postoperative outcomes with cholecystectomy in lung transplant recipients**
 Sharven Taghavi, MD, MPH, Vishnu Ambur, MD, Senthil N. Jayarajan, MD, MS, John Gaughan, PhD, Yoshiya Toyoda, MD, PhD, Elizabeth Dauer, MD, Lars Ola Sjöholm, MD, Abhijit Pathak, MD, Thomas Santora, MD, Amy J. Goldberg, MD, and Joseph Rappold, MD, *Philadelphia, PA*
 This study examined laparoscopic and OC in the LT population. The importance of this study is that it shows that cholecystectomy can be performed with minimal morbidity and mortality in the LT population.

TRAUMA/CRITICAL CARE

- 379 **Rate of lower-extremity ultrasonography in trauma patients is associated with rate of deep venous thrombosis but not pulmonary embolism**
 Zachary C. Dietch, MD, MBA, Brandy L. Edwards, MD, MSc, Matthew Thames, BA, Pujya M. Shah, MD, Michael D. Williams, MD, FACS, and Robert G. Sawyer, MD, FACS, *Charlottesville, VA*
 In this study, the authors find no association between rates of lower-extremity ultrasound screening and incidence of pulmonary embolism in trauma patients. The importance of this report is that aggressive screening protocols may be unwarranted.
- 386 **Fibrinolysis shutdown phenotype masks changes in rodent coagulation in tissue injury versus hemorrhagic shock**
 Hunter B. Moore, MD, Ernest E. Moore, MD, Peter J. Lawson, BA, Eduardo Gonzalez, MD, Miguel Fragoso, DVM, Alex P. Morton, MD, Fabia Gamboni, PhD, Michael P. Chapman, MD, Angela Sauaia, PhD, Anirban Banerjee, PhD, and Christopher C. Silliman, MD, PhD, *Denver, CO*
 Hemorrhagic shock increases tPA and promotes fibrinolysis. The importance of this finding is that

hemorrhagic shock is the likely driver of the highly lethal hyperfibrinolytic phenotype seen in trauma.

- 393 **Factors associated with failure-to-rescue in patients undergoing trauma laparotomy**
 Bellal Joseph, MD, FACS, Bardiya Zangbar, MD, Mazhar Khalil, MD, Narong Kulvatunyou, MD, Ansab A. Haider, MD, Terence O’Keeffe, MBChB, Andrew Tang, MD, Gary Vercruyse, MD, Randall S. Frieze, MD, and Peter Rhee, MD, MPH, *Tucson, AZ*
 In this study we aimed to identify patient-level risk factors associated with failure-to-rescue in patients undergoing trauma laparotomy. We found that uninsured status and prolonged resuscitation are independently associated with failure-to-rescue.

- 399 **Hydrogen inhalation protects against acute lung injury induced by hemorrhagic shock and resuscitation**
 Keisuke Kohama, MD, PhD, Hayato Yamashita, PhD, Michiko Aoyama-Ishikawa, PhD, Toru Takahashi, MD, Timothy R. Billiar, MD, Takeshi Nishimura, MD, Joji Kotani, MD, PhD, and Atsunori Nakao, MD, PhD, *Nishinomiya, Hyogo, and Okayama, Japan, and Pittsburgh, PA*
 We examined the effects of inhaled hydrogen on ALI caused by HS/R. The importance of this study is that it demonstrated that hydrogen may exert potent therapeutic effects against ALI.

- 408 **When is it safe to forgo abdominal CT in blunt-injured children?**
 Shannon N. Acker, MD, Camille L. Stewart, MD, Genie E. Roosevelt, MD, David A. Partrick, MD, Ernest E. Moore, MD, and Denis D. Bensard, MD, *Aurora and Denver, CO*
 We developed an algorithm to identify accurately children with low-grade blunt abdominal trauma who are unlikely to require intervention. The significance of this novel algorithm is that it allows clinicians to minimize the use of abdominal CT.

- 413 **Adherence to surgical antibiotic prophylaxis remains a challenge despite multifaceted interventions**
 Luke R. Putnam, MD, Courtney M. Chang, BA, Nathan B. Rogers, BA, Jason M. Podolnick, BS, Shruti Sakhuja, BS, Maria Matuszczak, MD, Mary T. Austin, MD, MPH, Lillian S. Kao, MD, MS, Kevin P. Lally, MD, MS, and KuoJen Tsao, MD, *Houston, TX*
 We determined that institutional adherence to preoperative, prophylactic antibiotic guidelines is a challenge despite multiple targeted interventions. Improvements in this area are essential to ensure optimal patient care.

- 420 **Anxiolytic medication is an independent risk factor for 30-day morbidity or mortality after surgery**
 Nicholas Ward, BSc, J. Scott Roth, MD, Clark C. Lester, MD, Lori Mutiso, PhD, Karen M. Lommel, DO, and Daniel L. Davenport, PhD, *Lexington, KY*
 This study examined the relationship between anxiolytic and antidepressant use on noncardiac operative outcomes. Results show anxiolytic use by 1 in 6 operative patients and that it is an independent predictor of poor short-term outcome.
- 428 **Readmissions after major cancer surgery among older adults**
 Russell C. Langan, MD, Chun-Chih Huang, PhD, Scott Colton, BS, Arnold L. Potosky, PhD, Lynt B. Johnson, MD, MBA, FACS, Nawar M. Shara, PhD, and Waddah B. Al-Refaie, MD, FACS, *Washington, DC*
 We assessed hospital readmission after major cancer surgery in elders. The significance of this report is that readmissions are now among the foremost targets in health care reform to improve quality of care while curtailing Medicare spending.
- 438 **Serum transthyretin is a predictor of clinical outcomes in critically ill trauma patients**
 Vincent Cheng, BA, Kenji Inaba, MD, FRCSC, FACS, Tobias Haltmeier, MD, Adam Gutierrez, BA, Stefano Siboni, MD, Elizabeth Benjamin, MD, PhD, Lydia Lam, MD, and Demetrios Demetriades, MD, PhD, FACS, *Los Angeles, CA*
 This is the first study to establish a significant association between TTR and surgical outcomes in critically ill trauma patients. This finding is significant because it can help identify trauma patients at risk of malnutrition.
- 445 **Calpain inhibition decreases myocardial apoptosis in a swine model of chronic myocardial ischemia**
 Brittany A. Potz, MD, MA, Ashraf A. Sabe, MD, Nassrene Y. Elmadhun, MD, Jun Feng, MD, PhD, Yuhong Liu, MD, Hunter Mitchell, BS, Peter Quesenberry, MD, M. Ruhul Abid, MD, PhD, and Frank W. Sellke, MD, *Providence, RI*
 CI improved apoptotic signaling, oxidative stress, and the percentage of apoptotic cells in ischemic myocardial tissue. The importance of this report is that it identifies the mechanism by which CI could serve as a therapy for CAD.

ONCOLOGY

- 453 **The effect of surgical approach on short-term oncologic outcomes in rectal cancer surgery**
 Emily F. Midura, MD, Dennis J. Hanseman, PhD, Richard S. Hoehn, MD, Bradley R. Davis, MD, Daniel E. Abbott, MD, Shimul A. Shah, MD, and Ian M. Paquette, MD, *Cincinnati, OH*
 This study demonstrated excellent short-term oncologic outcomes with a minimally invasive approach to rectal cancer surgery. The importance of these results is that minimally invasive techniques should be considered safe in rectal cancer surgery.
- 460 **Phase I dose escalation trial of nitroglycerin in addition to 5-fluorouracil and radiation therapy for neoadjuvant treatment of operable rectal cancer**
 Henrik Illum, MD, David H. Wang, MD, PhD, Jonathan E. Dowell, MD, William J. Hittson, MD, John R. Torrisi, MD, Jeffrey Meyer, MD, and Sergio Huerta, MD, FACS, *Dallas, TX*
 This phase I trial of NTG in addition to standard CRT in rectal cancer showed that NTG patches are well-tolerated and it is feasible to proceed with a phase II trial at the maximum dose examined (0.6 mg/h).
- 466 **Increasing incidence of duodenal neuroendocrine tumors: Incidental discovery of indolent disease?**
 Timothy L. Fitzgerald, MD, Samuel O. Dennis, BS, Swapnil D. Kachare, MD, Nasreen A. Vohra, MD, and Emmanuel E. Zervos, MD, *Greenville, NC*
 In this series, we noted a 400% increase in the incidence of D-NETs. Patients were also found to have an increase in early stage disease and a decrease in distant metastasis.
- 472 **Influence of body mass index on outcomes after major resection for cancer**
 Cheryl K. Zogg, MSPH, MHS, Benedetto Mungo, MD, Anne O. Lidor, MD, MPH, Miloslawa Stem, MS, Arturo J. Rios Diaz, MD, Adil H. Haider, MD, MPH, and Daniela Molena, MD, *Boston, MA, and Baltimore, MD*
 This study examined associations between body mass index and outcomes after major resection for cancer. Obese patients should be treated via optimal oncologic standards without being hindered by a perception of prohibitively increased perioperative risk.

486 **Prognostic relevance of lymph node ratio and total lymph node count for small bowel adenocarcinoma**

Thuy B. Tran, MD, Motaz Qadan, MD, Monica M. Dua, MD, Jeffrey A. Norton, MD, George A. Poultsides, MD, and Brendan C. Visser, MD, *Stanford, CA*

The number of lymph nodes and lymph node ratio are important prognostic factors of survival in patients with small bowel cancer. These findings provide guidance on the minimum number of nodes needed to be sampled when performing dissection for small bowel cancers.

494 **Occult metastases in node-negative breast cancer: A Surveillance, Epidemiology, and End Results–based analysis**

Charles W. Kimbrough, MD, Kelly M. McMasters, MD, PhD, Amy Quillo, MD, and Nicolas Ajkay, MD, *Louisville, KY*

We compared patients with node-negative breast cancer who underwent additional staging with immunohistochemistry. The significance of this report is that after looking at more than 90,000 patients, isolated tumor cells appear equivalent to N0 disease.

GENERAL SURGERY

501 **The relationship between duration of stay and readmissions in patients undergoing bariatric surgery**

Alex W. Lois, BS, Matthew J. Frelich, MS, Natasha A. Sahr, BS, Samuel F. Hohmann, PhD, Tao Wang, PhD, and Jon C. Gould, MD, *Milwaukee, WI, and Chicago, IL*

We used the University HealthSystem Consortium database to evaluate the relationship between length of stay following bariatric surgery and readmission. We found that patients with longer hospitalizations were more likely to be readmitted.

508 **The “weekend effect” in urgent general operative procedures**

Matthew A. C. Zapf, BA, Anai N. Kothari, MD, Talar Markossian, PhD, Gopal N. Gupta, MD, Robert H. Blackwell, MD, Phillip Y. Wai, MD, Cynthia E. Weber, MD, Joseph Driver, BS, and Paul C. Kuo, MD, MS, MBA, FACS, *Maywood, IL*

We found urgent surgeries that took place on the weekend were associated with greater cost, duration of stay, and complications. The importance of this finding is that now identified, this disparity can be addressed by targeted interventions.

515 **Surgical never events and contributing human factors**

Cornelius A. Thiels, DO, Tarun Mohan Lal, MS, Joseph M. Nienow, MBA, Kalyan S. Pasupathy, PhD, Renaldo C. Blocker, PhD, Johnathon M. Aho, MD, Timothy I. Morgenthaler, MD, Robert R. Cima, MD, Susan Hallbeck, PhD, and Juliane Bingener, MD, *Rochester, MN*

We report the first prospective analysis of human factors contributing to invasive procedural never events by using Human Factors Analysis and Classification System. Targeting interventions to address cognitive factors and team resource management may reduce never events in health care.

522 **Impact of gastrectomy procedural complexity on surgical outcomes and hospital comparisons**

Sanjay Mohanty, MD, Jennifer Paruch, MD, Karl Y. Bilimoria, MD, MS, Mark Cohen, PhD, Vivian E. Strong, MD, and Sharon M. Weber, MD, *Chicago, IL, Detroit, MI, New York, NY, and Madison, WI*

Secondary procedures performed during gastrectomy are associated with adverse outcomes, but adjusting for complexity does not affect hospital rankings. This is important for informed consent and optimizing risk adjustment for hospital profiling.

VASCULAR SURGERY

529 **CD4⁺ lymphocytes improve venous blood flow in experimental arteriovenous fistulae**

Juan C. Duque, MD, Laisel Martinez, MS, Annia Mesa, PhD, Yuntao Wei, MD, Marwan Tabbara, MD, Loay H. Salman, MD, and Roberto I. Vazquez-Padron, PhD, *Miami, FL*

We demonstrate that CD4⁺ lymphocytes have a protective effect on venous vascular remodeling after fistula creation. The significance of this work is that it calls for future studies on immune function and its role on fistula maturation.

537 **Preservation solution impacts physiologic function and cellular viability of human saphenous vein graft**

Eric S. Wise, MD, Kyle M. Hocking, PhD, Susan Eagle, MD, Tarek Absi, MD, Padmini Komalavilas, PhD, Joyce Cheung-Flynn, PhD, and Colleen M. Brophy, MD, *Nashville, TN*

This study determined the effect of preservation medium on saphenous vein graft physiology and viability, and found that saline harms the conduit. The importance of this finding is that it provides evidence advocating use of a buffered salt solution.

RACIAL/SOCIOECONOMIC DISPARITIES

547 Racial disparities in surgical outcomes: Does the level of resident surgeon play a role?

Navin R. Changoor, MD, Gezzar Ortega, MD, MPH, Mina Ekladios, MS, Cheryl K. Zogg, MSPH, MHS, Edward E. Cornwell III, MD, and Adil H. Haider, MD, MPH, *Washington, DC, and Boston, MA*

To elucidate whether disparities in outcomes are associated with the presence/level of surgical residents. Greater odds of complications among patients treated by senior residents need to be carefully weighed given the group's likelihood of operating on minorities.

556 Inequalities in the use of helmets by race and payer status among pediatric cyclists

Brian C. Gulack, MD, Brian R. Englum, MD, Kristy L. Rialon, MD, Lindsay J. Talbot, MD, Jeffrey E. Keenan, MD, Henry E. Rice, MD, John E. Scarborough, MD, and Obinna O. Adibe, MD, MHS, *Durham, NC*

Helmet use among children in the United States remains low and there are disparities by race and socioeconomic status. The importance of this finding is that it will aid in determining where to target the promotion of helmet use among children.

562 Geriatric emergency general surgery: Survival and outcomes in a low-middle income country

Adil A. Shah, MD, Adil H. Haider, MD, MPH, FACS, Robert Riviello, MD, MPH, FACS, Cheryl K. Zogg, MSPH, MHS, Syed Nabeel Zafar, MD, MPH, Asad Latif, MD, MPH, Arturo J. Rios Diaz, MD, Zia Rehman, MBBS, FCPS, and Hasnain Zafar, MBBS, FRCS, *Karachi, Pakistan, Boston, MA, Washington, DC, and Baltimore, MD*

We compared the epidemiology and outcomes of older versus younger adults with EGS conditions in South Asia.

Understanding the unique needs of geriatric patients is critical to enhancing management and prioritization of appropriate care in developing settings.

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