Ochsner Journal 17:e1–e80, 2017

ABSTRACTS
Ochsner's Fourteenth Annual Research Day
May 16, 2017
Ochsner Clinic Foundation
New Orleans, LA

Only titles and authors are listed for abstracts with copyright conflicts. For more information regarding those abstracts, please contact the *Ochsner Journal* editorial office at ocjournal@ochsner.org.

Fourteenth Annual Research Day Award Winners

The University of Queensland-Ochsner Clinical School Student Research Award		
1st Place	Stephen Chester, BA	Hypnosis Reduces Pain and Anxiety in Children With Acute Burn Injuries: A Randomized Controlled Trial (abstract 114)
2nd Place	Derek Corpus, BS	Chronic Obstructive Pulmonary Disease Patients Transition of Care Factors Associated With Emergency Department Utilization (abstract 57)
3rd Place	Jessica Ryder, BSc	Time to Antibiotics in Severe Sepsis and Septic Shock: Is There Time for Equipoise? (abstract 63)
Honorable Mention	Shani Truong, BS, MS	What Is The Gold Standard Model of Care for Pregnant Adolescents? (abstract 78)
Pharmacy Research Award		
1st Place	Stephanie Anne Elagizi, PharmD	Evaluation of Dosing and Monitoring of Argatroban at Ochsner Medical Center (abstract 20)
2nd Place	Poonam Kukreja, PharmD	Pharmacist-Driven Disease State Management Clinic: A Proposal (abstract 101)
Nursing Research Award		
1st Place	Tara Clesi, BSN, RN, WOC, COCN	Implementing Noncontact Low-Frequency Ultrasound in the Management of Deep Tissue Injuries (abstract 86; abstract not published at author request)
2nd Place	Lori Lemoine, DNP, APRN, FNP-BC, BC-ADM	Diabetes Distress in Patients With Type 2 Diabetes Hospitalized on Medicine Units (abstract 85)
3rd Place	Daneeka Woods, DNP, APRN, ANP-C, CDE	The Feasibility of Measuring Diabetes Distress and Implementing a Toolkit to Improve Outcomes in Adults With Uncontrolled Type 2 Diabetes (abstract 84)
Honorable Mention	Fiona Winterbottom, DNP, APRN, ACNS-BC, CCRN	Patient Surveillance and Predictive Modeling to Identify Patients at Risk of Decline (abstract 104)
Resident/Fellow Research Award		
1st Place	Aaron Klinger, MD	The Role of Bowel Preparation in Colorectal Surgery: Results of the 2012-2015 American College of Surgeons National Surgical Quality Improvement Program Data (abstract 59)
2nd Place	Todd M. Rosenthal, MD	Reduced Flow Capacity as Measured by Cardiac Positron Emission Tomography Predicts Ventricular Tachyarrhythmia in Patients With an Implantable Cardioverter Defibrillator (abstract 52)
3rd Place	William M. White, MD	A Decision Tree to Improve Antibiotic Stewardship in the Surgical Intensive Care Unit (abstract 46)
Honorable Mention	Luke McCrone, MD	Impact of Endotracheal Intubation on Endoscopic Retrograde Cholangiopancreatography Unit Efficiency (abstract 68)

1 Enhancing an Orthotopic Metastatic Colorectal Cancer Mouse Model With Surgical Tumor Debulking

Shannon McChesney, MD[1], Aaron Klinger, MD[1], Brian Reuter, MD[2], Linh Hellmers, BS[2], Grace Maresh, PhD[2], Li Li, MD, PhD[2,3], David Margolin, MD[1,3]

[1]Department of Colon and Rectal Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]Laboratory of Translational Cancer Research, Ochsner Clinic Foundation, New Orleans, LA [3]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Colorectal cancer (CRC) is a leading cause of cancer-related deaths in the United States. Metastatic disease portends a poor prognosis. Increased morbidity and mortality due to large primary tumor burden has hindered the study of metastases. This study aimed to evaluate the feasibility of surgical debulking of primary tumors in mice to humanely allow the continuation of CRC metastatic disease progression for further studies.

Methods: Luciferase-tagged HT-29 colon cancer cells were injected into the rectal submucosa of NOD/SCID mice. Primary tumor growth was monitored via bioluminescence imaging (BLI). The mice were randomized into 2 groups: surgical debulking and sham surgery. For debulking, the tumor was mobilized, and the bulk of the tumor was sharply removed from the rectum. For sham, the tumor was mobilized without removal. Postoperatively, mouse well-being was monitored and the progression of primary tumor and metastases were followed with weekly BLI evaluation.

Results: The mice were followed for 18 days postoperation. Comparison of tumor BLI of the debulking and sham groups on postoperative day 4 demonstrated a 55% decrease in the debulking group and a 55% increase in the sham surgery group. One mouse from the debulking group died from bowel obstruction on postoperative day 4. Two mice from the sham surgery group died from tumor burden 10 days postoperation. Of the surviving mice, 66% of the debulking mice developed distant organ metastases. The overall survival of the debulking group mice was 75% compared to 33% for the sham surgery mice, with a hazard ratio of 0.5.

Conclusion: This experiment demonstrates that debulking surgery for mice is feasible. Surgical debulking reduces primary tumor burden and allows longer survival, enabling the development of distant organ metastasis. This establishes a model that may be used for future studies of metastasis treatment.

2 The Vitamin D Receptor Effect on Colorectal Cancer Tumor Growth and Response to Therapies via Tumor-Initiating Cells in a Metastatic Orthotopic Mouse Model

Shannon McChesney, MD[1], Xin Zhang, MD, PhD[2], Aaron Klinger, MD[1], Linh Hellmers, BS[2], Grace Maresh, PhD[2], David Margolin, MD[1,3], Li Li, MD, PhD[2,3]

[1]Department of Colon and Rectal Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]Laboratory of Translational Cancer Research, Ochsner Clinic Foundation, New Orleans, LA [3]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Despite optimal treatment with surgery/chemotherapy, the recurrence rates in colorectal cancer (CRC) persist, in part due to the presence of tumor-initiating cells (TIC). Our published data investigated chemotherapy's effect on CRC and found the population of CRC-TIC (Co-TIC) (cells bearing CD133/CXCR4) to be enriched after treatment, resulting in increased CRC virulence and progression. Administered vitamin D (VD) is reported to synergize with chemotherapy, suggesting that VD receptor (VDR) facilitates targeting more virulent cancer cells. Therapeutic strategies targeting TICs may offer opportunity to treat metastatic CRC. Here, we investigate expression levels of VDR in CRC, its effect on Co-TIC, and its role in CRC *in vitro* and *in vivo* following combined treatment modalities of multiple cancer cell lines.

Methods: Baseline VDR expression levels in 6 CRC cell lines were examined using flow cytometry. The Co-TICs were defined by staining of CD133/ CXCR4. For *in vitro* assay, 6 CRC cell lines were treated with 5-fluorouracil (5FU) and examined for CD133/CXCR4 expression. For *in vivo* assay, luciferase-tagged CRC cell lines were injected intrarectally into mice. After 4 weeks, mice received calcitriol (VD3), 5FU, or both. Tumor growth and metastasis were measured weekly by bioluminescent imaging.

Results: VDR expression varied among CRC cell lines, from 54.34% to 98.67%, and was enriched among Co-TICs. By choosing variable VDR-expressing CRC cell lines, the *in vivo* experiment examined the effect of VDR-expression on response to treatment of metastatic CRC with calcitriol and 5FU.

Conclusion: Our data suggest that Co-TICs are key in CRC development *in vivo* and VDR expression is enriched among Co-TICs, thus suggesting that VDR is a target for virulent colon cancers using combined treatment with 5FU/calcitriol. Our orthotopic metastatic CRC model provides a platform to investigate variable VDR-expressing CRC cell lines, followed by treatment with 5FU/calcitriol to determine whether VDR expression level predicts response to combined treatment of metastatic CRC.

3 MEN1 and Paraganglioma: Expanding the Clinical Spectrum of MENIN Mutations

Daryl T. Goldman, BS[1], Jessica E. Harris, PhD[2], Emma Duncan, MBBS (Hons Class 1), PhD, LMusA[2,3]

[1]The University Of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]The University of Queensland Diamantina Institute, Translational Research Institute, Brisbane, Australia [3]Department of Endocrinology, Royal Brisbane and Women's Hospital, Brisbane, Australia

Background: Multiple endocrine neoplasia type 1 (MEN1) classically consists of parathyroid, pituitary, and pancreatic tumors. Here we report 2 unrelated cases with MEN1 with asymptomatic paragangliomas.

Methods: Patient 1 (P1) had a strong family and personal history of MEN1. Given the presence of pancreatic lesions with mild elevation of gastrin, a Ga-DOTATATE scan was done that demonstrated uptake in the left carotid region suggestive of paraganglioma. P1 had no symptoms or biochemical evidence of catecholamine excess. Histology of the resected mass showed a paraganglioma with equivocal staining for SDHB unlikely to be consistent with germline succinate dehydrogenase (SDHx) mutations. Patient 2 (P2) also had a strong family and personal history of MEN1. Although biochemically stable, he had an increasing pancreatic mass with marked uptake on Ga-DOTATATE. Fluorodeoxyglucose positron emission tomography (FDG-PET) suggested a high grade/poorly differentiated lesion, and he underwent a Whipple procedure. Histology demonstrated a grade 1 neuroendocrine tumor and a second lesion consistent with an extraadrenal paraganglioma that stained positively for SDHB, (SDHx mutation thus unlikely).

Results: Germline screening of all exons of MENIN showed that P1 was heterozygous for a c.1716delC mutation in exon 10, resulting in a frameshift and introduction of a premature stop codon. P2 was heterozygous for a c.1319delG mutation in exon 9, with similar effect. Sanger sequencing of DNA extracted from each tumor demonstrated loss of wild-type allele. Microarray genotyping (assessing for large copy number alteration) demonstrated loss of heterozygosity of chromosome 11 in both tumors, including the MENIN locus. Of note, P2 had differential aneuploidy of the paraganglioma and adjacent islet cell tumor.

Conclusion: The combination of paraganglioma in MEN1 has been reported extremely rarely (4 cases). P1 and P2 are undergoing germline screening for known pheochromocytoma/paraganglioma susceptibility genes. However, if negative, our data suggest that paraganglioma may rarely be part of the MEN1 syndrome.

4 Immune Checkpoints and Effectors and the Prediction of Survival in Follicular Lymphoma

Hyung Sun Yoo, MS[1], Josh Tobin, MBBS[2,3], Laurent Palmatier, MBBS[1], Maher K. Gandhi, PhD,[2,3], Li Li, MD, PhD[1,4]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Department of Haematology, Princess Alexandra Hospital, Brisbane, Australia [3]Translational Research Institute, The University of Queensland Diamantina Institute, Brisbane, Australia [4]Laboratory of Translational Cancer Research, Ochsner Clinic Foundation, New Orleans, LA

Background: Follicular lymphoma, the second most common form of non-Hodgkin lymphoma, is an incurable disease with a highly variable outcome. A clinical prognostic tool such as the Follicular Lymphoma International Prognostic Index has not been useful in evaluating and choosing treatments. Therefore, biomarkers to allow risk-stratified treatment and to predict response to novel therapies are needed. While the prognostic role of the tumor microenvironment has been demonstrated, the optimal method of enumerating the effects of immune checkpoints and effectors remains to be elucidated. We aimed to analyze the role of immune effectors within the tumor microenvironment in predicting the clinical outcome of patients with follicular lymphoma to provide a reliable prognostic marker for the patients.

Methods: The charts of all patients diagnosed with follicular lymphoma from 1988 to 2008 with pathologic specimen in the form of paraffin blocks were reviewed. Clinical data were extracted from clinical records, including Eastern Cooperative Oncology Group score, blood tests, imaging, pathology, stage, *Follicular Lymphoma International Prognostic Index* score, treatment regimen, and outcomes. The pathologic specimens were submitted to Dr Gandhi's laboratory (University of Queensland, Australia) for the quantification of immune effector and checkpoint gene expression using digital hybridization.

Results: A total of 205 patients were identified. Ninety-eight cases had complete chart reviews and pathology specimens. We identified 27 patients with local disease (stage I-II) and 71 patients with invasive disease (stage III-IV). Formalin-fixed paraffin-embedded tissue was retrieved, and tissues were cut and submitted for genetic studies.

Conclusion: We have established a patient-derived tissue database for follicular lymphoma. This cohort will be used as a validation cohort in the development of an immune score in patients with advanced stage follicular lymphoma. We expect this score will be predictive of survival in patients with follicular lymphoma that is independent of conventional clinical prognostic models.

5 Neurofibromin-1 Loss of Function in Hepatocellular Carcinoma: Implications in MEK Resistance and Sensitivity to mTOR Inhibitors

Kelley G. Núñez, PhD[1], Janet Gonzalez-Rosario, MS[1], Paul T. Thevenot, PhD[1], Ari Cohen, MD[2,3]

[1]Institute of Translational Research, Ochsner Clinic Foundation, New Orleans, LA [2]Multi-Organ Transplant Institute, Ochsner Clinic Foundation, New Orleans, LA [3]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Liver transplantation provides a curative option in early stage hepatocellular carcinoma (HCC). However, 5-year recurrence rates are ~50% and underscore the need for recurrence biomarkers in the pretransplant setting. RAS/RAF/MAPK and PI3K/PTEN/AKT/mTOR pathway hyperactivation is characteristic of HCC, driving tumor development and progression. Neurofibromin 1 (NF1) functions as a RAS GTPase controlling MAPK signaling. NF1 mutations are common to several malignancies and may play a role in tumorigenesis and drug resistance. We have identified an NF1 mutation in a patient with recurrent HCC. In this study, we used an HCC cell line to model the NF1 loss of function (RAS GTPase) mutation by creating an NF1 CRISPR knockout.

Methods: CRISPR gene editing was used to knock out NF1 protein expression in the SK-HEP-1 cell line and was validated by sequencing, surveyor assay, and mRNA expression. Hyperactivity in the MAPK and mTOR pathways was assessed in SK-HEP-1 $NF1^{-/-}$ cells in high/low glucose media and following stimulation with serum or the pathway-specific mitogens.

Results: In adherent SK-HEP-1 cells, NF1 expression was distributed diffusely in the cytoplasm and concentrated in the perinuclear region nonadherent cultures. NF1 deletion altered cell morphology to a prominent mesenchymal morphology with increased sensitivity to mechanical disruption. Although serum and amino acid withdrawal suppressed both mTOR and ERK activation in wild-type SK-HEP-1 cells, only mTOR phosphorylation was suppressed in SK-HEP-1 $NF1^{-/-}$ cells, with ERK phosphorylation remaining elevated with high glucose only. Overall, ERK activation in both SK-HEP-1 and $NF1^{-/-}$ cells was lower in low-glucose medium compared to high-glucose medium. Surprisingly, NF1 null cells did not form spheroids under stimulating conditions, consistent with an overactive EMT program.

Conclusion: NF1 mutations affecting the RAS GTPase domain cause ERK hyperactivation, resulting in mTOR hyperactivation. The role of NF1 mutation in sorafenib resistance and recurrence risk posttransplant is under investigation.

6 Examining the Efficacy of Chemotherapeutic Drugs in an Orthotopic Mouse Model for Pancreatic Cancer

Mae Lindner, BS[1], Xin Zhang, MD, PhD[2], Ryan Sherry, BS[2], Sara Cohen, BS[2], Michelle Ponder, PhD[3], Carlos Farina, HS[3], William Conway, MD[1,4], Li Li, MD, PhD[1,2]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Laboratory of Translational Cancer Research, Ochsner Clinic Foundation, New Orleans, LA [3]Tissue Bank, Laboratory of Translational Cancer Research, Ochsner Clinic Foundation, New Orleans, LA [4]Department of Surgery, Ochsner Clinic Foundation, New Orleans, LA

Background: Pancreatic adenocarcinoma (PAC) is the fourth leading cause of cancer-related death in the United States, with a 5-year survival rate <7%. This low survival rate is attributable to the fact that only 15%-20% of patients have a potentially resectable primary tumor, and approximately 40% of them have distant metastases at diagnosis. Initial chemotherapy with gemcitabine is an increasingly utilized treatment option for patients with metastatic PAC; however, the optimal regimen has not been established. Here we used an orthotopic xenograft mouse model to study the efficacy of gemcitabine monotherapy on PAC tumor growth and lung metastasis.

Methods: Luciferase-tagged PAC cell line, PANC-1 cells, was injected intrapancreas of NOD/SCID mice with and without lymph node stromal cell (LNSCs, HK). Tumor growth and metastasis were measured weekly by bioluminescent imaging (BLI). Different doses—0 mg/kg, 100 mg/kg, or 200 mg/kg—of gemcitabine were injected twice weekly into the mice. At the endpoint, the primary tumors were weighed, and lung and liver metastases were evaluated via BLI, H&E, and immunohistochemistry staining.

Results: In our orthotopic xenograft model, tumors generated from PANC-1 cells recapitulated the histologic architecture and biomarker vimentin staining characterized in PAC patient tumors. The addition of LNSCs significantly supports the primary PAC tumor progression and metastasis development. Mice treated with 100 mg/kg gemcitabine had decreased primary tumor size and metastasis compared to control groups, while all of the mice treated with 200 mg/kg gemcitabine died due to toxicity.

Conclusion: We established a unique *in vivo* PAC model that produced a primary tumor with similar histology to that of PAC patients. We observed a significant decrease in tumor size and metastasis with 100 mg/kg gemcitabine, which is similar to the reported clinical observation. This model provides a platform to investigate combination chemotherapeutic regimens and develop new individualized therapeutic approaches.

7 *In Vitro* Evaluation of Double Carbapenem Combinations for Synergy Against Carbapenemase-Producing *Klebsiella pneumoniae*

Diane Sibley, BS[1], Shelby Simar, BS[1], Deborah Ashcraft, BS[1], George Pankey, MD[1,2]

[1]Laboratory of Infectious Disease Translational Research, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Resistance mechanisms of carbapenemase-producing *Klebsiella pneumoniae* (CP-Kp) have led to widespread β-lactam antibiotic resistance, making these infections serious public health problems. Double-carbapenem therapy has been used clinically for successful treatment of severe infections caused by CP-Kp. When ertapenem is combined with other carbapenems, it is hypothesized that synergy may occur because of increased affinity of carbapenemases for ertapenem, leading to inability of those carbapenemases to react with second carbapenems. However, there have been conflicting reports from recent *in vitro* studies as to whether imipenem or meropenem demonstrates synergy with ertapenem. The aim of this study was to further investigate *in vitro* activity of combinations of ertapenem (with imipenem or meropenem) against CP-Kp.

Methods: Fifteen genetically unique clinical CP-Kp isolates were obtained from the CDC. MICs were determined by Etest and broth microdilution. Initial synergy (summation fractional inhibitory concentration $\leq$0.5) testing was performed using the Etest MIC:MIC method in triplicate (mean determined). Isolates synergistic by Etest were evaluated by time-kill assay (TKA) using ertapenem (1xMIC) + imipenem (1xMIC) or + meropenem (1xMIC) with CFU/mL determined at 0, 4, 8, and 24 h. *Synergy* was defined as a $\geq$2 $\log_{10}$ *decrease* in CFU/mL after 24 h by the combination compared to that of the most active single agent alone.

Results: With Etest, 7/15 (47%) displayed synergy with ertapenem + imipenem, including 3/15 (20%) that were also synergistic with ertapenem + meropenem. No antagonism was seen. TKA using the 7 isolates synergistic by Etest revealed synergy in only 1 at 24 h (ertapenem + imipenem). No synergy was seen with ertapenem + meropenem at 24 h.

Conclusion: Even though the combination of meropenem and ertapenem has been reported as successful therapy clinically and as synergistic *in vitro* by TKA against CP-Kp, our *in vitro* testing did not confirm these findings. Further *in vitro* testing with double-carbapenems, including doripenem, against additional carbapenemase-producing isolates is needed.

8 *In Vitro* Synergy of Ceftazidime-Avibactam Plus Rifampin Against *Pseudomonas aeruginosa*

Diane Sibley, BS[1], Shelby Simar, BS[1], Deborah Ashcraft, BS[1], George Pankey, MD[1,2]

[1]*Laboratory of Infectious Disease Translational Research, Ochsner Clinic Foundation, New Orleans, LA* [2]*The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA*

Background: *Pseudomonas aeruginosa* is a major cause of nosocomial infections. An emerging concern is the increased prevalence of multidrug resistance that limits treatment options. Ceftazidime-avibactam (CZA), FDA-approved in February 2015, is a novel cephalosporin/non–β-lactam β-lactamase inhibitor coupling that demonstrates antipseudomonal activity. Despite its recent release, resistance to this agent has been reported. Rifampin (RI) has shown *in vitro* and *in vivo* synergistic activity when combined with β-lactams and polymyxins against *P aeruginosa*. The aim of this study was to investigate any antimicrobial synergistic activity of the combination of CZA and RI against CZA-R *P aeruginosa* isolates.

Methods: *P aeruginosa* isolates were prospectively collected from 193 consecutive patients during the last 5 months of 2015. Recovery sources were respiratory (45%), urinary (24%), wound (16%), bloodstream (9%), and other (6%) infections. Initial antimicrobial susceptibilities were determined by MicroScan. CZA and RI MICs (μg/mL) were determined by Etest. FDA MIC (μg/mL) interpretive guidelines for CZA are $\leq$8 susceptible and $\geq$16 resistant. There are no CLSI or FDA interpretive guidelines for testing RI against *P aeruginosa*. Rep-PCR analysis was used to determine that CZA-R isolates were genetically unique. MICs and synergy testing (MIC:MIC method) of CZA-R isolates were performed in triplicate. The summation fractional inhibitory concentration ($\sum$FIC) was calculated: synergy, $\leq$0.5; additivity, $>$0.5-1.

Results: A total of 9/193 (5%) *P aeruginosa* isolates were resistant to CZA, including 6/27 (22%) with multidrug resistance (resistant to $\geq$1 agent in $\geq$3 antimicrobial categories). *In vitro* synergy by Etest was detected in 5/9 (67%) isolates ($\sum$FICs 0.1-0.5) and additivity in 4 ($\sum$FIC 0.9-1.0).

Conclusion: Even though ceftazidime-avibactam demonstrated excellent activity in the *P aeruginosa* isolates tested, resistance has already occurred. However, *in vitro* synergy or additivity was demonstrated against these CZA-R isolates with CZA plus RI. This combination should be further tested with additional isolates. *In vitro* synergy may not predict *in vivo* response.

9 Next-Generation Sequencing for Genomic Analysis of *Cfr*(B)-Producing *Enterococcus faecium* Causing Infections in Ochsner Health System

Lalitagauri Deshpande, PhD[1], Deborah Ashcraft, BS, MT[2], Craig Naccari, MD[3], Andrew Davis, BS[1], George Pankey, MD[2,3], Mariana Castanheira, PhD[1], Rodrigo Mendes, PhD[1]

[1]*Department of Molecular Biology, JMI Laboratories Inc, North Liberty, IA* [2]*Laboratory of Infectious Disease Translational Research, Ochsner Clinic Foundation, New Orleans, LA* [3]*The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA*

Background: CC17 is a major group of genetic lineage of *Enterococcus faecium* (EFM) that has spread worldwide and is associated with hospital outbreaks. We previously reported *cfr*(B) among 2 vancomycin-resistant enterococci (VRE) linezolid-resistant (LZD-R) clinical EFM index isolates (18203 and 18961) belonging to CC17 from patients within Ochsner Health System (*AAC* 2015;59:6256-6261). Four additional LZD-R VRE isolates from immunocompromised patients with severe underlying diseases (3-blood/2015 and 1-bone/2016) also harboring *cfr*(B) were isolated in this hospital system. This study presents the characterization of these isolates in comparison to the index strains using next-generation sequencing (NGS).

Methods: The EFM isolates were susceptibility tested by CLSI reference methods (M07-A10). Screening for oxazolidinone mechanisms including *cfr*, *optr*A, and mutations in 23S rRNA, L3, and L4 proteins was performed by PCR and sequencing techniques. Isolates were subjected to NGS, and epidemiological and *cfr*(B) genetic context information was extracted.

Results: Index isolates and 1/4 additional EFM were recovered from patients with previous LZD treatment. All isolates (these 4 plus 2 previously reported) were multidrug resistant, and LZD MICs were 8-16 μg/mL (LZD-R). G2576T in 23S rRNA was present, along with *cfr*(B) in all EFM. L3 and L4 proteins showed wild-type sequences, and *optr*A was not detected. The 2 index isolates belonged to ST794 (CC17), while the additional 4 EFM were categorized as ST794 or a close variant, ST78. *Cfr*(B) was located on a *Tn6218* structure and embedded in chromosomal DNA in all isolates.

Conclusion: NGS and analysis demonstrated that EFM isolates originated from a common ancestor. However, alterations in conserved MLST housekeeping gene suggest distant temporal relationships indicating prolonged persistency within the Ochsner system. Both G2576T and *cfr*(B) were chromosomally located; therefore, infection control measures should be effective in minimizing the spread of these multidrug-resistant EFM isolates.

10 Evaluation of the Rapid Polymyxin NP Test for Detection of Polymyxin B Resistance Using *Enterobacter cloacae* and *Enterobacter aerogenes* Isolates

Shelby Simar, BS[1], Diane Sibley, BS[1], Deborah Ashcraft, BS[1], George Pankey, MD[1,2]

[1]*Laboratory of Infectious Disease Translational Research, Ochsner Clinic Foundation, New Orleans, LA* [2]*The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA*

Background: Polymyxin resistance is an increasing problem worldwide. Currently, determining susceptibility to polymyxins is problematic and lengthy. They diffuse poorly into agar, potentially giving inaccurate disk diffusion and Etest results. A rapid screening test (2 hours) for detection of polymyxin resistance in Enterobacteriaceae was developed by Nordmann and Poirel (Rapid Polymyxin *NP* Test, 2016) that detects glucose metabolization in the presence of polymyxins via a pH-induced color change. Sensitivity and specificity were reported as 99.3% and 95.4%, respectively, with results obtained in $\leq$2 hours. Our study's goal was to evaluate this test using polymyxin B against a larger number of *Enterobacter*.

Methods: We tested 143 nonduplicate *Enterobacter* isolates (102 *E cloacae,* 41 *E aerogenes*), including 136 collected from Ochsner Health System patients from March through May 2016 and 7 known polymyxin-B resistant *E cloacae* isolates from JMI Laboratories (North Liberty, Iowa). Polymyxin B MICs were determined via broth microdilution. The European Committee on Antimicrobial Susceptibility Testing breakpoints were used: MICs $\leq$2 μg/mL susceptible and MICs $>$2 μg/mL resistant. For the rapid polymyxin NP test, a color change from orange to yellow was positive, and a weak or no color change was negative after 4 hours.

Results: A total of 25/143 isolates were polymyxin B-resistant by broth microdilution (MIC $>$2), including all 7 known polymyxin B-resistant JMI isolates. Of these 25, 7 were positive by the rapid polymyxin NP test (3/7 JMI isolates). All 118 isolates that were susceptible to polymyxin B by broth microdilution were NP test negative. Sensitivity and specificity for the rapid polymyxin NP test were 25% and 100%, respectively, compared to broth microdilution.

Conclusion: While the rapid polymyxin NP test is a much faster method (2-4 hours) for polymyxin resistance determination compared with broth microdilution (16-20 hours), our study indicates that it may be subject to limitations when testing *Enterobacter* species.

11 Comparison of Etest and Broth Microdilution Methods for Detection of Colistin Resistance in Clinical Isolates

Shelby Simar, BS[1], Diane Sibley, BS[1], Deborah Ashcraft, BS[1], George Pankey, MD[1,2]

[1]*Laboratory of Infectious Disease Translational Research, Ochsner Clinic Foundation, New Orleans, LA* [2]*The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA*

Background: Polymyxin resistance is being increasingly detected worldwide, and an accurate method of susceptibility determination remains elusive. Polymyxins diffuse poorly into agar, potentially resulting in inaccurate Etest and disk diffusion results. Currently, the Ochsner Medical Center-New Orleans microbiology laboratory performs in-house colistin Etests when a colistin MIC is requested. The goal of our study was to evaluate colistin MICs from Etest with the broth microdilution reference method using a variety of clinical bacterial isolates.

Methods: We tested 145 nonduplicate isolates collected from patients during 2015-2016: 62 *Acinetobacter* spp, 44 *Pseudomonas aeruginosa*, and 39 Enterobacteriaceae (13 *E coli*, 15 *Klebsiella* spp, and 11 *Enterobacter* spp). Colistin MICs were determined by Etest and broth microdilution. CLSI interpretive guidelines (μg/mL) were used: *P aeruginosa* $\leq$2 susceptible, 4 intermediate, $\geq$8 resistant; and *Acinetobacter* spp $\leq$2 susceptible, $\geq$4 resistant. For Enterobacteriaceae, European Committee on Antimicrobial Susceptibility Testing MIC breakpoints were used: $\leq$2 susceptible, $>$2 resistant. MICs from each method were in essential agreement if MICs were $\pm$1 twofold dilution and in categorical agreement if results were in the same interpretive category.

Results: The table shows the number of colistin nonsusceptible (COL-NS) isolates found by Etest and broth microdilution (BMD) and essential and categorical agreement between MICs by organism from each method.

Conclusion: Colistin resistance appears to be underreported via Etest method. Very major errors (COL-S by Etest, COL-R by BMD) were detected in 15% of Enterobacteriaceae and *Acinetobacter* spp isolates, which could be attributed to poor drug diffusion. Based on this study's data, it is recommended that broth microdilution be used when testing colistin for these organisms.

Table. Colistin Nonsusceptible (COL-NS) Isolates found by Etest and Broth Microdilution (BMD) and Essential and Categorical Agreement Between MICs by Organism

n=145	# COL-NS by Etest (% I or R)	# COL-NS by BMD (% R)	Essential Agreement	Categorical Agreement
Enterobacteriaceae	1/39 (3%) R	6/39 (15) R	23/39 (59%)	33/39 (85%)
P aeruginosa	2/44 (5%) I	0/44 (0%)	21/44 (48%)	42/44 (95%)
Acinetobacter spp	1/62 (2%) R	10/62 (68%)	42/62 (68%)	53/62 (85%)

12 Genetically Modified Autologous Kidney Stem Cells—A Novel Strategy to Enhance the Lifespan of Engraft

Allyson E. Bradley, MSPH[1], Himanshu Vashistha, PhD[1], Ashwani Malhotra, PhD[2], Pravin C. Singhal, PhD[2], Leonard G. Meggs, MD[3]

[1]Institute of Translational Renal Research, Ochsner Clinic Foundation, New Orleans, LA [2]The Feinstein Institute for Medical Research, Hofstra Northwell School of Medicine, Hempstead, NY [3]Department of Nephrology, Ochsner Clinic Foundation, New Orleans, LA

13 Aging Phenotype(s) in Kidneys of Diabetic Mice Are p66ShcA Dependent

Himanshu Vashistha, PhD[1], Allyson E. Bradley, MSPH[1], Ashwani Malhotra, PhD[2], Pravin C. Singhal, PhD[2], Leonard G. Meggs, MD[3]

[1]Institute of Translational Renal Research, Ochsner Clinic Foundation, New Orleans, LA [2]The Feinstein Institute for Medical Research, Hofstra Northwell School of Medicine, Hempstead, NY [3]Department of Nephrology, Ochsner Clinic Foundation, New Orleans, LA

14 Reversal of Epigenetic Alterations in Diabetic Nephropathy Was Associated With Decrease in Proteinuria

Himanshu Vashistha, PhD[1], Allyson E. Bradley, MSPH[1], Frank Abbruscato, BS[1], Ashwani Malhotra, PhD[2]

[1]Institute of Translational Renal Research, Ochsner Clinic Foundation, New Orleans, LA [2]The Feinstein Institute for Medical Research, Hofstra Northwell School of Medicine, Hempstead, NY

15 Deficiency of the Angiotensinase Aminopeptidase A Increases Susceptibility to Glomerular Injury

Juan Carlos Q. Velez, MD[1,2], Wayne R. Fitzgibbon, PhD[3], Ehtesham Arif, PhD[3], Michael G. Janech, PhD[3]

[1]Department of Nephrology, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [3]Division of Nephrology, Medical University of South Carolina, Charleston, SC

16 MAPK Signaling Components Involved in Transforming Growth Factor Beta 1–Mediated Support of Axonal Regeneration

Michelle Beavers, BS

Laboratory of Translational Neurosurgery Research, Ochsner Clinic Foundation, New Orleans, LA

Background: Previous works demonstrated that treatment of chronically denervated sciatic nerve with transforming growth factor beta 1 (TGF-β1) and forskolin (FSK) promoted axonal regeneration. In this study, we investigated the mitogenic signaling components involved in the growth-supporting effects of TGF-β1 and FSK.

Methods: Using a chronic tibial nerve injury and delayed repair rat model, the tibial nerve was transected and after 8 weeks, it was repaired and treated with FSK, TGF-β1, TGF-β1 plus FSK, or saline. After 6 weeks, the repair site and distal nerve stump were harvested. Total RNA (500 ng) was prepared for real-time PCR profiling using a custom TGF-β signaling prime PCR array. Expressions of mitogen-activated protein kinases (MAPK) associated with the TGF-β signaling and myelin-associated genes (PMP22, MBP) were normalized to the reference gene (GAPDH), and fold change was determined relative to the saline-treated site of repair.

Results: Compared to the saline-treated site of repair, both TGF-β1 and FSK resulted in a greater than 2-fold increase in the expressions of MEK1, MEK2, MEK6, ERK1, ERK2, and TAK1 at the site of repair; TGF-β1/FSK also upregulated these signaling components, except for MEK2. In the distal nerve stump, TGF-β1 increased the expression of all components except for TAK1, whereas FSK downregulated these signaling components. TGF-β1/FSK decreased MEK2, MEK6, and TAK1 expression but not MEK1 and ERK1. Compared to the site of repair, these signaling components were expressed at lower levels in the distal nerve stump in the TGF-β1, FSK, and TGF-β1/FSK groups. Myelin-associated genes were upregulated in the distal nerve stump.

Conclusion: TGF-β1 and FSK have antagonistic effects on the MAPK signaling components at the site of repair and the distal nerve stump. Decreased expression of MAPK signaling components correlates with increased myelination and vice versa. TGF-β1/FSK treatment differentially affects the MAPK signaling pathway and may function to modulate and maintain axonal regeneration in the chronically denervated nerve.

17 Cytokines and Neutrophils in Spontaneous Intracerebral Hemorrhages

Vi T. Tran, BS[1], Michelle Beavers, BS[2], Lauren Nimelstein, MS[2], Doan Nguyen, PhD[2], Wale Sulaiman, MD, PhD[3], Ifeanyi Iwuchukwu, MD[4]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Laboratory of Translational Neurosurgery Research, Ochsner Clinic Foundation, New Orleans, LA [3]Department of Neurosurgery, Ochsner Clinic Foundation, New Orleans, LA [4]Department of Neurology, Ochsner Clinic Foundation, New Orleans, LA

Background: The presence of neutrophils after spontaneous intracerebral hemorrhages (ICH) in stroke patients indicates the presence of inflammatory processes. Recruitment of these neutrophils has been shown to be mediated by various cytokines, both from damaged tissues and the surrounding environment. It is hypothesized that the volume of ICH corresponds to increased levels of cytokines, resulting in increased neutrophil counts.

Methods: ICH patients (n=36) were consented, and plasma fractions were collected at day 1 and day 3 postadmission and used to analyze for MMP2, MMP3, MMP9, MMP13, IL-6, and IL-1β. Patients were stratified based on ICH volumes >30 mL or <30 mL and admission leukocytes >12 or <12. Samples from healthy individuals (n=4) were also collected to be used as a control. Bio-Plex Multiplex assays and ELISAs were used to analyze the samples. Statistical analyses were carried out using the 2-tailed *t* test of equal variances.

Results: Levels of MMP2, MMP3, and MMP9 analytes were found to be elevated overall in the plasma of ICH patients, whereas MMP13, IL-1β, and IL-6 were found to be minimally expressed. There was no statistical significance in IL-6 levels when compared to high-volume (62.6 pg/mL) vs low-volume (44.69 pg/mL) ICH bleeds. IL-6 levels at day 1 for admission leukocytes <12 was 35.95 pg/mL, while the IL-6 level for admission leukocytes >12 was 114.25 pg/mL; the difference did not reach statistical significance (P=0.051). Analysis of day 1 vs day 3 for admission leukocytes >12 was 114.25 pg/mL vs 28.70 pg/mL, respectively (P=0.056).

Conclusion: We demonstrated a general upward trend in the expression of MMP2, MMP3, MMP9, and IL-6 in ICH patients. The current focus in our laboratory is to increase the sample size, along with exploring expression of other cytokines that may play a role in recruitment of neutrophils.

18 Monitoring Pregnancy Complications: Impact of Oxygen Tension on the Regulation of microRNA Profile and Bioactivity of Exosome Release From Extravillous Trophoblasts

Angela Nakahara, BS[1], Omar Mohamed Elfeky, BS[2], Sherri Longo, MD[1,3], Grace Truong, BS[2], Gregory Rice, PhD[4], Carlos Salomon, PhD[4]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Exosome Biology Laboratory, Centre for Clinical Diagnostics, UQ Centre for Clinical Research, Royal Brisbane and Women's Hospital, Faculty of Medicine and Biomedical Sciences, The University of Queensland, Australia [3]Department of Obstetrics and Gynecology, Ochsner Baptist Hospital, New Orleans, LA [4]Exosome Biology Laboratory, Centre for Clinical Diagnostics, UQ Centre for Clinical Research, Royal Brisbane and Women's Hospital, Faculty of Medicine and Biomedical Sciences, The University of Queensland, Australia; Department of Obstetrics and Gynecology, Ochsner Baptist Hospital, New Orleans, LA

Background: Recently, our understanding of how cells communicate has undergone a paradigm shift since the recognition of the role of exosomes on intercellular signaling. In this study, we investigated whether oxygen tension alters the exosome release and microRNA (miRNA) profile from extravillous trophoblasts (EVTs), modifying their bioactivity on endothelial cells.

Methods: We have established the exosomal miRNA profile at early gestation in women who develop preeclampsia (PE) and spontaneous preterm birth (SPTB). The effect of oxygen tension (ie, 8% and 1% oxygen) on exosome release was quantified using nanocrystals (Qdot) coupled to CD63 by fluorescence NTA. A real-time, live-cell imaging system (IncuCyte) was used to establish the effect of exosomes on endothelial cells (ECs). Plasma samples were obtained at early gestation (<18 weeks) and classified according to pregnancy outcomes. An Illumina TruSeq Small RNA kit was used to construct a small RNA library from exosomal RNA obtained from EVT and plasma samples.

Results: The number of exosomes was significantly higher in EVTs cultured under 1% compared to 8% oxygen. In total, 741 miRNA were identified in exosomes from EVTs. Bioinformatic analysis revealed that these miRNA were associated with cell migration and cytokine production. Interestingly, exosomes isolated from EVTs cultured at 8% oxygen increased EC migration, while exosomes from 1% oxygen decreased EC migration. These changes were inversely proportional to TNF-α released from ECs. Finally, we have identified a set of unique miRNA in exosomes from EVTs cultured at 1% oxygen and exosomes isolated from maternal samples at early gestation who developed PE and SPTB later in pregnancy.

Conclusion: We suggest that aberrant exosomal signaling by placental cells is a common etiologic factor in pregnancy complications characterized by incomplete SpA remodeling and is therefore a clinically useful biomarker of pregnancy complications.

19 Influence of Maternal Body Mass Index on the Exosomal Profile During Gestation and Their Role on Maternal Systemic Inflammation

Omar Mohamed Elfeky, BS[1], Angela Nakahara, BS[2], Sherri Longo, MD[2,3], Gregory Rice, PhD[4], Carlos Salomon, PhD[4]

[1]Exosome Biology Laboratory, Centre for Clinical Diagnostics, UQ Centre for Clinical Research, Royal Brisbane and Women's Hospital, Faculty of Medicine and Biomedical Sciences, The University of Queensland, Australia [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [3]Department of Obstetrics and Gynecology, Ochsner Baptist Hospital, New Orleans, LA [4]Exosome Biology Laboratory, Centre for Clinical Diagnostics, UQ Centre for Clinical Research, Royal Brisbane and Women's Hospital, Faculty of Medicine and Biomedical Sciences, The University of Queensland, Australia; Department of Obstetrics and Gynecology, Ochsner Baptist Hospital, New Orleans, LA

Background: Obesity is one of the most serious health issues we face today. Recent studies report that 52% of women are either overweight or obese, with 35% of them of reproductive age (25-35 years). During pregnancy, the placenta releases particles known as exosomes into maternal circulation, and their concentration is higher in pregnancy complications.

Methods: A time-series study design was used to establish the relationship between maternal body mass index (BMI) and exosome concentration during pregnancy. Blood samples were obtained from pregnant women at Ochsner Baptist Medical Center (New Orleans, LA) at different times of gestation (10-38 weeks) and classified by maternal BMI into lean (n=15), overweight (n=15), and obese (n=15) at the moment of sample collection. The total number of exosomes and specific placenta-derived exosomes were determined by nanoparticle tracking analysis (NanoSight) using quantum dots coupled with CD63 or PLAP antibodies. The effect of exosomes on cytokine (IL-6. IL-8, IL-10 and TNF-α) release from endothelial cells (ECs) was established by protein solution array analysis (Bio-Plex 200).

Results: The total number of exosomes present in maternal circulation was strongly correlated with maternal BMI. The contribution of placental exosomes to the total exosomal population decreases with higher maternal BMI across gestation. Exosomes present in maternal circulation increase IL-6, IL-8, and TNF-α release from ECs, an effect significantly higher when exosomes were isolated from obese women compared to lean and overweight women.

Conclusion: This study established that maternal BMI is a factor that explains a significant component of the variation in the exosome data. We suggest that exosomes may contribute to maternal systemic inflammation during pregnancy.

20 Evaluation of Dosing and Monitoring of Argatroban at Ochsner Medical Center

Stephanie Anne Elagizi, PharmD, Yana Bukovskaya, PharmD, BCPS, Katherine Jennings, PharmD, BCCCP, Ngoc Vu, PharmD, BCPS

Department of Pharmacy, Ochsner Clinic Foundation, New Orleans, LA

Background: Argatroban is indicated for anticoagulation in patients with heparin-induced thrombocytopenia (HIT). Argatroban dosing is weight based with initial doses of 2 mcg/kg/min and requires monitoring to achieve therapeutic efficacy and avoid bleeding. Studies have shown that patients with multiorgan dysfunction require lower initial doses ranging from 0.5-1.2 mcg/kg/min. The purpose of this study was to evaluate argatroban dosing requirements in patients with and without multiorgan dysfunction, as well as to evaluate the appropriateness of Ochsner's argatroban nomogram.

Methods: This single-center, retrospective, cohort study included patients $\geq$18 years with confirmed or suspected HIT treated with argatroban for at least 24 hours. The primary outcome of this study was the mean maintenance dose to achieve 2 consecutive therapeutic activated partial thromboplastin times. Secondary outcomes included appropriate diagnosis of HIT, rates of in-hospital bleeding, and critical analysis of the institution nomogram.

Results: A total of 75 patients were included in the study. Patients with multiorgan dysfunction required significantly lower argatroban maintenance doses vs patients without multiorgan dysfunction (1.1 vs 2.0 mcg/kg/min, P=0.0007). In-hospital bleeding rates between patients with multiorgan dysfunction and those without were high but not significantly different (67.4% vs 51.7%, P=0.27). With respect to the diagnosis of HIT, 17 patients (23%) were ELISA negative, 30 patients (40%) were ELISA positive/serotonin release assay negative, and only 6 patients (8%) were HIT positive. The current institution nomogram includes laboratory monitoring every 2 hours which was followed only 37% of the time, while argatroban levels were within therapeutic range 75% of the time.

Conclusion: Patients with multiorgan dysfunction should be started on lower argatroban doses. Significant potential for savings exists in reducing unnecessary costs in medication use, frequent laboratory monitoring, and nursing time.

21 The Distinct Role of Tfh and Th17 Cells and Their Interplay in the Pathogenesis of Rheumatoid Arthritis

Frank Migliore, DO[1], Sedrick Bradley, MD[1], Quretul Quresh, MD[1], Jerald Zakem, MD[1], Tamika Webb-Detiege, MD[1,2], William Davis, MD[1,2], Zongbing You, MD, PhD[3], Robert Quinet, MD[1,2], Xin Zhang, MD, PhD[4]

[1]Department of Rheumatology, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [3]Department of Structural and Cellular Biology, Tulane University Health Science Center, New Orleans, LA [4]Laboratory of Translational Cancer Research, Ochsner Clinic Foundation, New Orleans, LA

Background: Rheumatoid arthritis (RA) is an autoimmune disease characterized by the presence of autoantibodies and chronic inflammation in synovium leading to progressive joint destruction. Recently, Tfh and Th17 cells have emerged as novel T cell subsets controlling autoimmunity. Our previous data showed that circulating Tfh (cTfh) and Th17 (cTh17) cells were increased in RA patients. CTfh cells but not cTh17 cells from RA patients were able to drive B cells to differentiate into plasma cells *in vitro*. Here, we further investigated the correlation of cTfh cells and their signature cytokine IL-21 with cTh17 cells and their correlations with clinical parameters in RA patients.

Methods: Peripheral blood was collected from 61 RA patients and 61 healthy donors. RA patients were divided into remission (<2.6) and active groups (>2.6) based on disease activity score. Clinic parameters including RF, anti-CCP, ESR, and CRP were obtained. The frequencies of cTfh and cTh17 cells were measured by flow cytometry. Serum IL-21 and IL-17 were detected by ELISA. Correlations of the frequency of cTfh/IL-21 with cTh17/IL-17 and clinic parameters were statistically determined.

Results: The increased frequency of cTfh cells significantly correlated with the level of anti-CCP antibody ($P<0.01$) in active RA patients, whereas increased frequency of cTh17 cells correlated with CRP level ($P<0.05$). The level of cTfh cells and serum IL-21 were significantly correlated with the percentage of cTh17 cells in RA patients ($P<0.05$). The serum IL-17 level nonsignificantly correlated with CRP in RA patients.

Conclusion: cTfh cells may be involved in RA pathogenesis by inducing autoantibody generation, while cTh17 cells largely related to inflammation. Tfh cells may also steer T cell differentiation into Th17 cells which secrete the proinflammatory cytokine IL-17 and contribute to the inflammation. Disrupting the signals provided by Tfh and Th17 cells may offer new therapeutic strategies for RA patients.

22 Role of Circulating microRNA in Carotid Atherosclerotic Plaque Vulnerability: Implications for Stroke

Pravitha Jayapratap, MBBS,[1,2] Hernan A. Bazan, MD,[1,2] T. Cooper Woods, PhD,[3] Samuel Hatfield, BS[3]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Department of Surgery, Ochsner Clinic Foundation, New Orleans, LA [3]Tulane Heart and Vascular Institute and the Department of Physiology, Tulane School of Medicine, New Orleans, LA

23 Do microRNA Carried by Extracellular Vesicles From Lymph Node Stromal Cells Have a Role in the Pathogenesis of Colorectal Cancer Metastasis?

Aaron Klinger, MD[1], Xin Zhang, MD, PhD[2], Grace Maresh, PhD[2], Linh Hellmers, BS[2], Carlos Salomon, PhD[3], Li Li, MD, PhD[2,4], David Margolin, MD[1,4]

[1]Department of Colon and Rectal Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]Laboratory of Translational Cancer Research, Ochsner Clinic Foundation, New Orleans, LA [3]Exosome Biology Laboratory, Centre for Clinical Diagnostics, UQ Centre for Clinical Research, Royal Brisbane and Women's Hospital, Faculty of Medicine and Biomedical Sciences, The University of Queensland, Australia; Department of Obstetrics and Gynecology, Ochsner Baptist Hospital, New Orleans, LA [4]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Colorectal cancer (CRC) is the third most common malignancy worldwide. The presence of extranodal metastasis results in poor prognosis. Previous studies suggest that metastasis is associated with the interaction of cancer cells and the lymph node (LN) stromal microenvironment via extracellular vesicle (EV)–mediated communication. Among the cargo of these EVs are microRNAs (miRNAs), small noncoding RNAs that can target mRNA to alter gene expression. We aim to identify the role of specific mRNAs in CRC progression through miRNA targeting using our unique patient-derived metastatic CRC mouse model for primary tumor growth and distant organ metastases.

Methods: EVs were obtained from HK cells, an LN stromal cell (LNSC) line, and mesenteric LNSC samples using ultrafiltration. The RNA samples extracted from EVs and intact cells were then analyzed using next-generation sequencing revealing which miRNAs were most concentrated in EVs. Potential cancer cell targets for these miRNAs were predicted using mirPath v.3 software.

Results: HK cells, LNSC cells, and EVs from each sample were analyzed for expression of 2,822 known human miRNAs. Six hundred fifty-three miRNAs were detected in EVs from both cell preparations. The top 8 collectively expressed miRNAs were selected for further analysis. Analysis with software revealed these miRNAs to affect genes involved in genetic pathways important to CRC, including TP53, KRAS, and APC.

Conclusion: These results show that the miRNAs carried by LNSC EVs may play a significant role in multiple well-studied oncologic pathways. We are currently analyzing CRC patient specimens of normal and tumor tissue for their miRNA profiles and comparing them to our LNSC data to reveal miRNAs that may be introduced or enhanced in cancer cells via LNSC-derived EVs. Regulating these miRNAs and their target mRNAs may reveal their effects on CRC progression and allow for future creation of novel targeted therapies.

24 A Humanized Immune System Mouse Model for Epstein-Barr Virus-Positive Gastric Cancer—Role of the Viral BNLF2a Gene

Grace Maresh, PhD[1], Xin Zhang, MD[1], Xia Wang, PhD[2], Claire Roberts, PhD[2], Erik Flemington, PhD[2], Li Li, MD, PhD[1,3]

[1]Laboratory of Translational Cancer Research, Ochsner Clinic Foundation, New Orleans, LA [2]Department of Pathology, Tulane University Health Sciences Center, New Orleans, LA [3]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Gastric carcinoma (GaCa), the fourth most common malignancy in the world, is associated with Epstein-Barr virus (EBV), although how the virus contributes to GaCa is unclear. The viral gene BNLF2a interferes with MHC class I peptide presentation and therefore may help tumor cells evade the immune response. We are establishing a mouse model with reconstituted human immune cells to understand the effects of EBV-BNLF2a on GaCa tumor initiation, progression, and metastasis.

Methods: NOD-SCID IL-2R$\gamma^{-/-}$(NSG) mice were irradiated (3 Gy) soon after birth and injected intraliver with 3 luciferase-tagged human GaCa cell lines (YCCEL-1-Luc, NCC24-Luc $\pm$BNLF2a gene) with or without human umbilical cord hematopoietic CD34^{+} stem cells (HSCs). Tumor growth was visualized via bioluminescent imaging. Human T and B cells in the spleen, bone marrow, and blood were examined by antibody staining and flow cytometry. Fixed tissues were sectioned, and immunohistochemistry was performed using antibodies to cells in mitosis, blood vessels, and human immune cells.

Results: Up to 18% HLA-DR^{+} human immune cells were detected in these mice, comparable to the commercial standard of humanized mice bearing 20%-25% human cells. Their spleens demonstrated correct localization but different numbers of human B and T cells. Weekly imaging showed more tumor growth from all cell lines when no HSCs were injected. BNLF2a-expressing cells showed slightly less tumor growth than nonexpressing cells when the mice had HSCs. Antibody-stained tissue sections showed tumor cells growing in the livers and metastasized to the lungs of these mice with differing amounts of blood vessel involvement.

Conclusion: A humanized mouse model for EBV-associated GaCa in NSG mice has been developed, allowing us to study the genesis of GaCa and the role EBV-BNLF2a plays in modulating the GaCa tumor growth and metastasis and host immune responses which could lead to the discovery of therapies for EBV-associated GaCa.

25 Immune Inhibitory Modulators as Biomarkers of Resistance in Stress Induced Drug Tolerant Melanoma Cells and Patients With Refractory Metastatic Melanoma

Hilary R. Keller, MBBS, MPhil[1,2]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Laboratory of Translational Cancer Research, Ochsner Clinic Foundation, New Orleans, LA

Background: With the advent of new and combination immunotherapy, the shift toward immune-based treatments is promising for resistant melanoma. Melanoma cells exhibit an early stress-induced drug-tolerant state upon hypoxia or drug exposure, preceding permanent resistance. This state is characterized by CD271 expression on tumor cells, a marker involved in $CD8^+$ or cytotoxic T lymphocyte (CTL) suppression, and the downregulation of T cell–recognized melanoma antigens, melan-A and tyrosinase. However, whether the expression of immune inhibitory markers such as PD-1 and PD-L1 plays a role in treatment resistance remains unknown. To address this role, we have constructed a tissue microarray (TMA) to examine the expression of immune inhibitory markers in refractory melanoma.

Methods: Human melanoma cell lines were stressed with hypoxia or docetaxel chemotherapy, and CD271 expression was assessed by flow cytometry. To investigate CTL lysis, murine melanoma cells were stressed with hypoxia or docetaxel, cultured with tumor-specific CTLs, and assessed for lysis by flow cytometry. To investigate immune inhibitory marker expression in refractory metastatic patient tumors, 128 tumor blocks from 85 patients with stage IIIc/IV disease were identified and retrieved, and a TMA was constructed for immunohistochemistry staining of these markers.

Results: Expression of CD271 on human melanoma cells was upregulated under hypoxia or docetaxel treatment. CTL lysis of stressed murine melanoma cells was reduced by 40%. Patient demographics indicate >50% of stage IIIc/IV patients undergoing targeted immunotherapy or both had recurrence. The evaluation of CD271, PD-1, and PD-L1 expression levels in these patients is currently underway.

Conclusion: Stressed human melanoma cells upregulate inhibitory molecules such as CD271, and stressed murine melanoma cells show increased resistance to CTL killing. Future experiments will investigate inhibitory marker expression in metastatic patients with recurrence under targeted or immunotherapy to predict the most appropriate and effective treatment regimen for personalized therapies.

26 Metabolomic Analysis of Donation-After-Circulatory Death Liver Allografts Reveals Distinct Alterations in Energy Metabolism

John Seal, MD[1,2], Matthew Wright, BS[2], Humberto Bohorquez, MD[1,2], David Bruce, MD[1,2], Emily Bugeaud, MD, PhD[1], Ian Carmody, MD[1,2], Ari Cohen, MD[1,2], George Loss, MD, PhD[1,2], Jeffrey Culver, MS[3,4], Christopher Petucci, PhD[3], Stephen Gardell, PhD[3]

[1]Multi-Organ Transplant Institute, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [3]Sanford Burnham Prebys Medical Discovery Institute, Orlando, FL [4]Southeast Center For Integrated Metabolomics, Gainesville, FL

Background: Donation-after-circulatory death (DCD) donors constitute an important opportunity to expand the donor pool for liver transplantation, but the opportunity is limited by the duration of donor warm ischemia time (WIT) from withdrawal of support to hypothermic preservation. Targeted metabolomic analysis generates a snapshot of the physiologic state of tissue by measuring the abundance of specific metabolites and may offer insight into key changes in liver allograft physiology to guide organ selection.

Methods: We applied a metabolomics approach to comprehensively quantify mediators of central energy metabolism in DCD (n=10) vs standard donation after brain death (DBD, n=14) groups. Targeted metabolomic analyses were performed using liquid chromatography and mass spectroscopy to quantify amino acids (AAs), organic acids, pyridine and adenine nucleotides, and acetyl-/malonyl-CoAs using isotope-labeled internal standards.

Results: The mean donor WIT in the DCD group was 20.5 ± 7.8 minutes. There was no difference in cold ischemia time for THE DCD and DBD groups (4.8 vs 4.3 hours, $P=0.42$), and both groups had 100% patient and graft survival at 1 year. Concentrations of ATP and ADP were significantly lower in the DCD group ($P=0.021$). Acetyl-CoA was also markedly decreased in DCD livers (-37%, $P=0.009$). With the exception of glutamine, all AAs were significantly higher in DCD livers compared to DBD grafts, ranging from a 44.8% increase for glycine ($P=0.022$) to a 104.2% increase for tyrosine ($P=0.001$). All AAs that displayed a significant increase in DCD livers can replenish TCA cycle intermediates through anaplerotic reactions. We did not observe significant differences in organic acid levels between DCD and DBD donors. A significant increase in NMN, a precursor to NAD, in the DCD group suggests a potential bottleneck in pyridine nucleotide metabolism.

Conclusion: Using a targeted metabolomics approach, we identified distinct alterations in energy metabolism in DCD livers that could guide more judicious and expanded donor utilization in liver transplantation.

27 Lymph Node Stromal Cell Extracellular Vesicles Containing Rab13 Promote Tumor Growth and Progression in Human Colorectal Cancer

Ryan Sullivan, MBBS[1,2], Grace Maresh, PhD[2], Xin Zhang, MD, PhD[2], Linh Hellmers, BS[2], Shannon McChesney, MD[3], Zhen Lin, MD, PhD[4], Heather Green, MS[3], Erik Flemington, PhD[4], David Margolin, MD[1,3], Li Li, MD, PhD[1,2]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Laboratory of Translational Cancer Research, Ochsner Clinic Foundation, New Orleans, LA [3]Department of Colon and Rectal Surgery, Ochsner Clinic Foundation, New Orleans, LA [4]Department of Pathology, Tulane University Health Sciences Center, New Orleans, LA

Background: Colorectal cancer (CRC) is the third leading cause of cancer death in the United States. Although mortality has decreased recently due to improved screening methods, patient prognosis is still severely affected by the formation of extranodal metastases. Therefore, a better understanding of advanced disease is crucial for uncovering novel therapeutic interventions. Extracellular vesicles (EVs) have recently emerged as important cell-to-cell communication vehicles in cancer growth and development. Our preliminary data show that lymph node stromal cells (LNSCs) provide supportive roles for CRC progression using EVs. We have identified Rab13 mRNA within LNSC-derived EVs as one potential mediator of disease.

Methods: EVs were isolated from LNSCs by ultracentrifugation, and their mRNA contents were analyzed using next-generation sequencing. RNAs were ranked by enrichment levels in EVs compared to LNSCs. HK, an LNSC-line, was transfected with siRNA to Rab13 (si-Rab HK). Supernatant collected from si-Rab HK cells was added to CRC cells *in vitro* for proliferation assays. Results were compared to Rab13 nonsilenced HK (si-NS HK) and wild-type (WT) HK cell supernatant. Next, si-Rab HK cells were coinjected with HT-29 cells, a CRC cell-line, intrarectally using our established orthotopic human CRC model and compared to si-NS HK and WT HK cells.

Results: Rab13 was highly enriched within LNSC-derived EVs and shown to be successfully silenced by siRNA using qPCR. CRC cell lines incubated with si-Rab HK cell supernatant showed a significant decrease in proliferation compared to si-NS HK and WT HK cell supernatant. Furthermore, mice that were coinjected intrarectally with si-Rab HK and HT-29 cells showed a significant decrease in tumor formation and metastasis compared to controls.

Conclusion: Rab13 is highly enriched in LNSC-derived EVs, and preliminary data suggest it has a significant effect on CRC progression. Further studies assessing Rab13 inhibitors are necessary to uncover its use as a novel therapeutic target.

28 Exploring Medical 3-Dimensional Printing at Ochsner

Theresa H. Nguyen, BS[1], Korak Sarkar, MD[1,2]

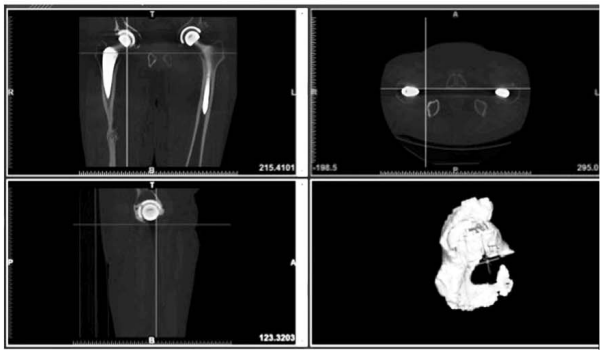
[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Department of Neurology, Ochsner Baptist Hospital, New Orleans, LA

Background: Three-dimensional (3D) printing is an increasingly popular method for generating patient-customized models from imaging modalities such as computed tomography (CT) and magnetic resonance imaging (MRI). With the technology rapidly becoming more efficient and affordable, many centers are exploring the role of 3D printing in medicine. 3D prototypes have been shown to be useful in operative planning for transplant, neurosurgery, orthopedics, cardiac surgery, and several other fields. Our study assessed the feasibility of producing patient prototypes at Ochsner with a completely in-house process.

Methods: A form 2 stereolithography (SLA) 3D printer and Mimics Imprint postprocessing software were acquired through a seed grant to establish a medical 3D printing laboratory. In conjunction with Ochsner's Information Systems Department, the postprocessing software was securely integrated into Ochsner's picture archiving and communication system (PACS) client. Digital imaging and communications in medicine files are imported from PACS into the postprocessing software to isolate regions of interest, segment, and remove artifacts. The virtual 3D rendering is exported to a SLA file for printing utilizing Formlabs resin. We further process the prototype via curing and support removal to render the final 3D model.

Results: We successfully established the Ochsner medical 3D printing laboratory and developed a system for completely in-house prototype production. Our internalized 3D printing process can create patient-customized models with minimal risk to protected health information.

Conclusion: 3D printing is a novel and innovative tool. We believe 3D printing can be a valuable asset to Ochsner's clinical and educational operations. More research is needed to improve process efficiency and prototype quality. Furthermore, we are actively exploring 3D model applications across different departments at Ochsner, including orthopedic surgery, radiology, neurosurgery, and transplant.



29 Humanized Mouse Models: Propel Cancer Research by Harboring the Immune Environment in Cancer Patients

Xin Zhang, MD, PhD[1], Grace Maresh, PhD[1], Thao Vu, BS[2], Doris Ratcliff, BS[2], Robert V. Emmons, MD[2,3], Nakhle Saba, MD[4], Li Li, MD, PhD[1,3]

[1]Laboratory of Translational Cancer Research, Ochsner Clinic Foundation, New Orleans, LA [2]Department of Bone Marrow Transplantation, Ochsner Clinic Foundation, New Orleans, LA [3]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [4]Department of Hematology and Medical Oncology, Tulane University School of Medicine, New Orleans, LA

Background: A barrier to cancer research is that >80% of novel drug candidates fail to prove efficacy when tested in humans due to no suitable animal models to recapitulate the pathogenesis in humans. The NSG mouse strain (NOD/SCID$^-$IL-2$\gamma^{-/-}$) lacks immune cells, which allows the tumor specimens to be implanted in the mouse but does not reflect the immune response due to the lack of immunocompetent cells. Thus, the establishment of humanized mouse models by introducing human immune cells into the NSG mouse before engrafting the tumor specimen would accurately reflect the immune environment present in humans. Here, we established a human-to-mouse model by using CD34$^+$ cells from human cord blood.

Methods: CD34$^+$ hematopoietic stem cells (HSCs, CD34$^+$, CD3$^-$, CD20$^-$, CD14$^-$) were enriched from human umbilical cord blood by MACS Column. NSG mice (H-2Kd) were irradiated within 48 hours of birth and injected intraliver with CD34$^+$ HSCs. Human T cell, B cell, and their subsets were detected in mice blood, spleen, and bone marrow by flow cytometry at different time points. These immune cells were further confirmed on the frozen slides of mice spleen by immunohistochemistry staining.

Results: H-2Kd$^-$HLA-DR$^+$ human cells were detected in mice spleen, blood, and bone marrow as early as 6 weeks after injection and reached peak at week 12. At week 12, 18% of human cells were detected in the spleen, which is comparable to the commercial humanized mice from Jackson Laboratory with 20%-25% of human cells. The majority of these human cells in humanized mice are CD3$^+$ T cells, and very few are CD20$^+$ B cells. These cells were also observed in the T cell and B cell zones in mice spleen.

Conclusion: HSCs isolated from human cord blood are capable of differentiating and expanding in irradiated NSG mice. This established humanized mouse model will allow a detailed evaluation of the *in vivo* immune responses of tumorigenesis.

30 IL-33/Cyclin D1 Imbalance in Severe Liver Macrosteatosis Predicts Susceptibility to Ischemia Reperfusion Injury

Janet Gonzalez-Rosario, MS[1], Kelley G. Núñez, PhD[1], Anderson Frank, BS[1], Gretchen Galliano, MD[2], Paul T. Thevenot, PhD[1], Ari Cohen, MD[3,4]

[1]Institute of Translational Research, Ochsner Clinic Foundation, New Orleans, LA [2]Department of Pathology, Ochsner Clinic Foundation, New Orleans, LA [3]Multi-Organ Transplant Institute, Ochsner Clinic Foundation, New Orleans, LA [4]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Donor livers with severe macrosteatosis (MaS) are at increased risk of primary nonfunction (PNF) after liver transplantation. Lipid-laden hepatocytes have a decreased cellular-stress threshold, resulting in catastrophic necrosis from ischemia reperfusion injury (IRI) associated with the transplantation process. Fatty liver disease incidence is rising, mirroring an increase in the prevalence of MaS in liver procurements. In this study, we investigated hepatic IL-33 and cyclin D1 levels as a risk index to predict PNF risk in an animal model MaS-IRI injury.

Methods: Rats were fed a methionine- and choline-deficient (MCD) diet for 3 weeks to achieve MaS >90%. The IRI injury model was 70% ischemia for 1 hour with hepatectomy of the nonischemic lobes prior to reperfusion.

Results: For animals with severe MaS, hepatic levels of IL-33 decreased (MCD: 105.4 $\pm$ 12.7 vs 280.7 $\pm$ 23.2 pg/mg, $P<0.05$) without a corresponding increase in serum IL-33. Cyclin D1 levels increased (MCD: 9.7 fold) in the absence of NF-κB p65 phosphorylation (MCD: 2.3-fold decrease). Two of the 7 animals with high levels of nuclear cyclin D1 prior to IRI either did not survive or had persistent MaS after 7 days on standard chow. Animals exposed to IRI showed 35% 24-hour survival, which correlated with increased cyclin D1 and decreased IL-33 levels. In the absence of IRI, withdrawing the MCD diet normalized IL-33 and cyclin D1 levels to baseline.

Conclusion: In severely macrosteatotic livers, increased cyclin D1 and IL-33 levels identified severe macrosteatotic livers at a significant risk of failure after IRI. Decreasing hepatic IL-33 without a corresponding increase in the serum suggests IL-33 may have a hepatoprotective effect. Furthermore, increased cyclin D1 protein in the nucleus prior to IRI could indicate poor outcome. This biomarker panel, prior to injury, may identify the subset of cp livers with increased susceptibility to PNF.

31 Predictive Model for a Modified Definition of Early Allograft Dysfunction in Liver Transplant Recipients

Amjad Bokhari, MD[1], Ari Cohen, MD[1,2], Anas Alharbi, MD[1], Ramona Nicolau, MD[3], Humberto Bohorquez, MD[1,2], David Bruce, MD[1,2], John Seal, MD[1,2], Ian Carmody, MD[1,2], Dennis Sonnier, MD[1], Emily Bugeaud, MD[1], George Loss, MD[1,2]

[1]Multi-Organ Transplant Institute, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [3]Department of Anesthesiology, Ochsner Clinic Foundation, New Orleans, LA

Background: Early allograft dysfunction (EAD) post liver transplant (LT) was historically defined as the presence of one or more of the following: alanine (ALT)/aspartate (AST) aminotransferases >2,000 IU/L within the first week, international normalized ratio (INR) ≥1.6, and bilirubin ≥10 mg/dL on day 7. The aim of this study was to evaluate EAD risk factors and build a predictive model for a large single center.

Methods: A total of 1,132 patients underwent LT between 2010-2016. Logistic regression was performed to identify markers of injury linked to EAD and the predictive model associated with 6-month patient and graft survival. $P<0.05$ was statistically significant.

Results: The incidence of historic EAD was 32% (360/1,132). Logistic regression showed that the model was statistically significant; however, the ALT/AST >2,000 criteria were not one of the 3 predictor factors associated with 6-month patient and graft survival. A novel logistic regression showed that the model was statistically significant for 6-month patient and graft survival when ALT >3,000 IU/L or AST >6,000 IU/L was one of the 3 predictor factors; the predicted response is presented in the Table. The incidence of the new EAD criteria was 15% (166/1,132).

Conclusion: A higher AST/ALT level is needed to define EAD largely when fatty livers and donation-after-cardiac-death grafts are used. The probability for 6-month patient and graft survival increases based on the number of risk factors associated with EAD.

Table. The Predicted Response for 6-Month Patient and Graft Survival Based on the New Definition of Early Allograft Dysfunction

ALT >3,000 IU/L or AST >6,000 IU/L in Week 1	Bilirubin ≥10 mg/dL Day 7	INR ≥1.6 Day 7	Number of Patients	6-Month Mortality Probability	6-Month Graft Failure
No	No	No	966 (85%)	3%	1%
Yes	No	No	73 (7%)	8%	4%
No	Yes	No	60 (5%)	12%	4%
No	No	Yes	10 (1%)	15%	8%
Yes	Yes	No	11 (1%)	28%	16%
Yes	No	Yes	2 (0.2%)	34%	26%
No	Yes	Yes	4 (0.3%)	43%	26%
Yes	Yes	Yes	6 (0.5%)	69%	61%

32 Outcomes of Donation-After-Cardiac-Death Liver Transplantation Utilizing Donors With High Donor Risk Index

Emily Bugeaud, MD, PhD[1], Narendra Battula, MD[1], Humberto Bohorquez, MD[1,2], David Bruce, MD[1,2], Ian Carmody, MD[1,2], Ari Cohen, MD[1,2], Lucia De Gregorio, MD[1], John Seal, MD[1,2], Dennis Sonnier, MD[1], George Loss, MD, PhD[1,2]

[1]Multi-Organ Transplant Institute, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Early experience with donation-after-cardiac-death (DCD) liver transplantation has suggested inferior outcomes compared to donation-after-brain-death liver transplantation, leading many programs to develop stringent selection criteria for DCD liver utilization and resulting in higher discard rates.

Methods: Utilizing the donor risk index (DRI), we retrospectively reviewed the outcomes of 115 consecutive DCD primary liver transplants between 2003 and 2014, comparing outcomes of donors with low DRI (<2, n=62) vs high DRI (>2, n=53).

Results: The demographics of recipients in both groups were comparable, including age (55 vs 55, $P=0.972$) and Model for End-Stage Liver Disease score (21 vs 20, $P=0.2165$). There were differences in donor demographics consistent with variables included in DRI calculations. The mean DRI scores in the low-DRI vs high-DRI groups were 1.7 vs 2.23, respectively ($P<0.0001$). In the high-DRI group, donors were older (46 vs 32, $P<0.0001$), included more African Americans (23% vs 10%, $P=0.0282$), and had more donors as a consequence of cerebrovascular accident (43% vs 15%, $P=0.0003$). There were more local donors in the low-DRI group (63% vs 43%, $P=0.452$) and more nationally imported donors in the high-DRI group (9% vs 0%, $P=0.0067$). There was no difference in cold ischemic time (4.5 vs 4.9, $P=0.0895$). Comparing the low-DRI and high-DRI groups at 1, 3, and 5 years, we saw no differences between patient survival (88% vs 92%, 87% vs 92%, 80% vs 79%, respectively, $P=0.3039$) or graft survival (82% vs 91%, 82% vs 87%, 73% vs 83%, respectively, $P=0.3624$). There was no difference in ischemic cholangiopathy (5% vs 6%, $P=0.4203$) or minor biliary complications (17% vs 22%, $P=0.2304$). The number of patients requiring retransplant was equally low in both groups (2% vs 2%, $P=0.4562$).

Conclusion: A more aggressive utilization of DCD organs for liver transplantation should be considered as an acceptable means of addressing organ scarcity.

33 Donor-Recipient Matching in Deceased Donor Liver Transplantation: Analysis of Outcomes Using United Network for Organ Sharing Match Sequence Data

John Seal, MD[1,2], Humberto Bohorquez, MD[1,2], David Bruce, MD[1,2], Emily Bugeaud, MD, PhD[1], Ian Carmody, MD[1,2], Ari Cohen, MD[1,2], Dennis Sonnier, MD[1], George Loss, MD, PhD[1,2]

[1]Multi-Organ Transplant Institute, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Liver allografts with steatosis, advanced age, ischemic injury, or donation after circulatory death (DCD) are infrequently used for the higher Model for End-Stage Liver Disease (MELD) score recipients prioritized in United Network for Organ Sharing (UNOS) match run sequencing. Transplanting these livers into low MELD, physiologically stable recipients may represent an opportunity to expand organ utilization.

Methods: We retrospectively analyzed outcomes at a high-volume US center using the UNOS match sequence number (MSN) as a proxy for allograft quality. From January 2012 to March 2015, complete data were available for 559 liver transplants (MSN range 1-7,536; median=7). The fourth quartile of MSN donors (23-7,536; n=144) was compared to the low-MSN group (1-23; n=415).

Results: A higher proportion of donor livers in the high-MSN group was regional import (0.47 vs 0.28, $P<0.001$), national import (0.42 vs 0.04, $P<0.001$), and DCD (0.19 vs 0.09, $P=0.0013$). The proportion of hepatitis C positive, hepatitis B core antibody positive, and Public Health Services increased risk was similar in both groups. The mean physiologic MELD score at the time of transplant was lower in the high-MSN group (19.3 vs 25.8, $P<0.001$). Cold ischemia times were longer for the high-MSN group (364.8 vs 295.9 min, $P<0.001$), but warm ischemia times were similar (29.6 vs 28.6 min, $P=0.06$).The rate of early allograft dysfunction was higher in the high-MSN group (0.34 vs 0.19, $P<0.001$), but the mean length of hospitalization was shorter (11.6 vs 22.7 days, $P<0.001$). There was no significant difference in graft ($P=0.41$) or patient ($P=0.35$) survival during the study period.

Conclusion: Expanded utilization of marginal liver allografts in lower MELD score patients is possible without compromising outcomes.

34 Results of 100 Consecutive Donation-After-Circulatory-Death Liver Transplants Using a Thrombolytic Protocol

John Seal, MD[1,2], Humberto Bohorquez, MD[1,2], David Bruce, MD[1,2], Emily Bugeaud, MD, PhD[1], Ian Carmody, MD[1,2], Ari Cohen, MD[1,2], Dennis Sonnier, MD[1], George Therapondos, MD[2,3], Natalie Bzowej, MD[3], Shoba Joshi, MD[3], Gia Tyson, MD[3], Nigel Girgrah, MD, PhD[3], George Loss, MD, PhD[1,2]

[1]Multi-Organ Transplant Institute, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [3]Department of Gastroenterology and Hepatology, Ochsner Clinic Foundation, New Orleans, LA

Background: In early 2010, our center implemented a thrombolytic protocol for donation-after-circulatory-death (DCD) liver transplantation in an effort to reduce biliary complications and improve graft survival. The protocol included retrograde flush of the hepatic veins and administration of tissue plasminogen activator (tPA) (2 mg) and verapamil (5 mg) into the donor hepatic artery immediately after portal reperfusion.

Methods: We conducted a retrospective review of 100 consecutive DCD liver transplants using the tPA protocol.

Results: Recipient characteristics included a median age of 56.3 years (range, 21-70.3 years), median body mass index (BMI) of 27.9 kg/m^2 (range, 16.6-47.5), and median Model for End-Stage Liver Disease score of 22 (range, 7-40). Donor characteristics included a median age of 40 years (range, 5-62), BMI of 28.6 (range, 19.4-49.6), peak donor aspartate aminotransferase (AST) of 122 (range, 17-1,949) and alanine aminotransferase (ALT) of 87 (range, 6-1,268). Donors were from local (n=41), regional (n=49), or national (n=10) allocation. Median ischemia times included donor warm ischemia (extubation to flush) of 23 minutes (range, 9-56 minutes), cold ischemia time of 4.8 hours (range, 2.6-9.7 hours), and in situ warm ischemia (implantation) of 28 minutes (range, 17-51 minutes). Median intraoperative blood transfusion was 2 units of packed red blood cells (range, 0-35). Early allograft function was assessed by median peak AST 1,607 (range, 339-15,872), ALT 571 (range, 59-4,932), international normalized ratio (day 7) 1.1 (range, 0.8-2.7), total serum bilirubin (day 7) 2.0 (range, 0.4-19.2). There were 2 hepatic artery thromboses; 1 early required retransplantation and a second late thrombosis formed collaterals. Biliary complications occurred in 25 patients, including 7 leaks and 18 anastomotic strictures, all successfully treated with endoscopic stent. We observed 4 cases of ischemic-type diffuse cholangiopathy: 1 in conjunction with hepatic artery thrombosis required retransplantation, 2 were asymptomatic with improvement, and 1 resolved. One- and 3-year patient survival was 91.5% and 87.8%, and graft survival was 91.6% and 87.9%, respectively, by log-rank analysis.

Conclusion: In conjunction with donor heparinization and minimization of cold ischemia time, a DCD liver protocol including tPA can result in satisfactory patient and graft survival with a low incidence of ischemic cholangiopathy.

35 Histology of Acute Rejection. Retrospective Review of Biopsy Data From 2014 to 2015: For-Cause Biopsy

Jorge C. Garces, MD[1,2], Catherine Staffeld-Coit, MD[1,2], Zohreh S. Soltani, MD[1], Sixto Giusti, MD[1,2], Pinky Patel, MD[1]

[1]Multi-Organ Transplant Institute, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Kidney biopsy remains the gold standard for diagnosis of antibody-mediated rejection (AMR).

Methods: We reviewed transplant biopsies performed from January 1, 2014 to December 31, 2015. The data for 2014 included 42 living donors and 78 deceased donor kidney transplants. The data for 2015 included 30 kidney donors and 82 deceased donor kidney transplants. We reviewed the Scientific Registry of Transplant Recipients (SRTR) data available for Ochsner (SRTR based on data available December 2015). Eighty-eight percent were first recipients; 10% were highly sensitized (PRA >80%); 49.9% were AA; 58% were male; 61.35% were >50 years; and 11.4% were retransplants.

Results: In 2014, 17 episodes of acute rejection (AR) occurred. In 2015, 18 episodes of AR occurred. The 2014 rejection rate (RR) was 14% DDKT and 11.9% for LRDs. In 2015, RR was 16% and 20% for recipients from DDKT, 6.6% for LRDs. The histology of the rejection is as follows: 15 episodes of pure acute cellular rejection (ACR) with lymphocytic infiltrate, 4 of plasma cell-rich rejection, 2 of pure AMR, and 11 of mixed rejection (cellular and antibody). Fourteen ACRs had a vascular component and 3 had transplant glomerulopathy. Recipients with lymphocytic infiltrate and tubulitis ACR received a methylprednisolone (MP) pulse 5 mg/kg for 3 days. Plasma cell-rich ACR was treated with MP pulse and low threshold to start T cell depleting agents (ATG) if no rapid response, typically 3 to 5 infusions. Mixed rejections received a minimum of 5 doses of ATG in addition to 3 to 5 plasmapheresis sessions, intravenous immunoglobulin 2 gm/kg, and rituximab (Rituxan) 1 to 2 doses. For patients with ACR with lymphocytic infiltrate, the mean creatinine at the end of the analysis was 2.12 mg/dL. Patients with mixed rejection had a mean creatinine of 3 mg/dL. For plasma cell-rich ACR, the mean creatinine was 1.25 mg/dL. For patients with pure AMR, the mean creatinine was 2.2 mg/dL. Three patients died, and 3 developed end-stage renal disease.

Conclusion: Detailed histologic analysis of biopsy results and longitudinal follow-up are critical to better understand response to therapy.

36 SiLK: Single-Incision Approach for Combined Liver-Kidney Transplantation

Larsa Al-Omaishi, BS[1], Narendra Battula, MD[2], Ian Carmody, MD[1,2], Emily Bugeaud, MD, PhD[2], Humberto Bohorquez, MD[1,2], David Bruce, MD[1,2], Ari Cohen, MD[1,2], George Loss, MD, PhD[1,2]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Multi-Organ Transplant Institute, Ochsner Clinic Foundation, New Orleans, LA

Background: Single-incision dual-organ transplantation has been successfully reported in heart-liver, kidney-pancreas, and dual kidney transplantation. Since the implementation of the Model for End-Stage Liver Disease allocation, the incidence of combined liver-kidney transplantation (CLKT) has steadily increased. Historically, the operation has been performed utilizing 2 separate incisions. In an effort to reduce wound complications, operative time, and cost of the procedure, we report on the novel use of a single-incision liver-kidney approach.

Methods: We performed a retrospective analysis of all CLKT performed from January 2010 to January 2016. The first SiLK transplant was performed in January 2014 and since then has become the default approach for CLKT. Outcomes from SiLK were compared with the historical dual-incision group.

Results: One hundred thirty-one CLKTs were performed during the study period, and 52 of them were SiLK, starting in 2014. All SiLK procedures were performed with the use of intraoperative dialysis. Kidney-specific complications for the SiLK group included 2 kidney graft thromboses, 1 closed loop bowel obstruction requiring bowel resection, 1 perinephric hematoma, and 2 reoperations for kidney repositioning. The operating times and reexploration rate were significantly lower for SiLK. The hospital cost was 1.4 times lower than the control group. Demographics and an outcomes analysis are presented in the Table.

Conclusion: This is a report of the largest series of SiLK. The technique has potential benefits to decrease wound complications, operative time, reexploration rates, and cost. The SiLK approach to CLKT is novel and offers several advantages over dual incision when technically feasible. Currently, we have modified our SiLK technique to prevent kidney graft malposition. We will continue to assess the long-term outcomes.

Table. Demographics and Outcome Analysis

	Liver-Kidney – Dual Incision n=79 (60%)	SiLK n=52 (40%)	P Value
Recipient age (median)	59 (6-71 yrs)	56 (8-69 yrs)	0.5
Recipient gender (M/F)	50/29	29/23	0.8
Donor age (median)	32 (8-54 yrs)	29 (16-61 yrs)	0.6
Donor gender (M/F)	49/30	33/19	0.5
MELD (median)	25 (11-39)	25 (19-40)	0.8
Pre-transplant ICU (n)	13 (16%)	8 (15%)	1.0
Re-liver transplant(n)	10 (12%)	7 (13%)	1.0
Ascites	39 (47%)	45 (85%)	0.0001
Intraoperative blood loss (mL)	5000 (900-17000)	3000 (600-21000)	0.7
Cold ischemic time- kidney (median)	455 (240-1200 min)	450 (316-1370 min)	0.3
Operating time (median)	546 (490—746 min)	420 (358-594 min)	0.05
HD- post op	7 (8%)	4 (8%)	0.6
Wound complications	9 (11%)	3 (6%)	0.36
Exploration for bleeding	15 (18%)	3 (6%)	0.03
Kidney rejection	13 (16%)	3 (6%)	0.17
Hospital stay (median)	21 (6-188 days)	16 (6-141 days)	0.8
Kidney graft failure (1 year)	10 (12%)	3 (6%)	0.25
Kidney graft thrombosis	0	2 (4%)	0.51
Patient death (1 year)	15 (18%)	4 (8%)	0.08

37 Results of High-Risk Donation-After-Circulatory-Death Donor Liver Transplants

Narendra Battula, MD[1], Humberto Bohorquez, MD[1,2], Lucia De Gregorio, MD[1], John Seal, MD[1,2], Emily Bugeaud, MD[1], David Bruce, MD[1,2], Ian Carmody, MD[1,2], Ari Cohen, MD[1,2], George Loss, MD[1,2]

[1]Multi-Organ Transplant Institute, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Appropriate donor and recipient selection along with some modifications in surgical techniques can improve utilization of donation-after-circulatory-death (DCD) grafts. Recently, we showed comparable recipient and allograft survival using DCD grafts. Further, there was no DCD allograft loss from primary ischemic cholangiopathy. Recipient heparinization prior to caval clamping and intraarterial tissue plasminogen activator after portal reperfusion are potentially useful techniques. Here, we examine our experience using high-risk DCD livers.

Methods: We conducted a retrospective review of all DCD transplants from March 2010 through January 2016. A comparative analysis was performed using potential variables associated with allograft dysfunction or failure (ie, advanced donor age, allograft steatosis, and import status).

Results: During the study period, 1,152 liver transplants were performed. One hundred (8.7%) were DCD grafts; of these, 29 were from donors >50 years of age, 27 had biopsy-proven steatosis >30% (micro and macrosteatosis), and 51 were imported. Donor and recipient demographics were similar between groups, including mean Model for End-Stage Liver Disease scores. Minimum follow-up was 6 months (range, 6-75 months). Patient and graft 1-year survival rates were 91.5% and 90.1% using DCD donors <50 years vs 93.1% and 93.1% for donors ≥50 years (P=0.95, P=0.22). Patient and graft 1-year survival rates were 91.8% and 90.4% for DCD livers with <30% steatosis vs 92.6% and 92.6% for those with ≥30% steatosis (P=0.47). Patient and graft 1-year survival rates were 100% and 97.6% for DCD livers procured within the local organ procurement organization vs 87.9% and 86.2% for imported livers (P=0.2, P=0.2).

Conclusion: Our experience, while limited, suggests that carefully selected expanded DCD grafts can be successfully used with results comparable to both standard DCD and donation-after-brain-death livers. Expanded DCD utilization across the country may be useful to help address the organ-shortage crisis.

38 Utilizing Imported Liver Grafts for Hepatocellular Carcinoma Recipients

Narendra Battula, MD[1], Lucia De Gregorio, MD[1], John Seal, MD[1,2], Emily Bugeaud, MD[1], Humberto Bohorquez, MD[1,2], Ian Carmody, MD[1,2], David Bruce, MD[1,2], Ari Cohen, MD[1,2], George Loss, MD[1,2]

[1]Multi-Organ Transplant Institute, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Hepatocellular carcinoma (HCC) is the third most common cause of cancer-related death in the United States. Liver transplantation (LT) offers the best chance of a cure in selected patients. Transplant centers are facing challenges with an increasing proportion of the HCC population on the waitlist. Waitlist mortality or dropout due to tumor progression is a critical time-limiting factor. Imported liver grafts (ILG) from outside the organ procurement organization (OPO) are one potential source to increase the center's donor pool; however, these organs typically are viewed as being of inferior quality. Further, it has been previously hypothesized that an enhanced ischemic reperfusion injury in these grafts could stimulate the tumor cell growth. The aim of this study was to assess our experience with imported grafts with a focus on recurrence and overall survival for HCC recipients.

Methods: We conducted a retrospective analysis of all organ offers for HCC recipients between June 2005 and December 2014. Descriptive statistics are presented as mean or median. Kaplan-Meier curves were generated using SPSS software. All ILGs were carefully assessed for quality using picture documentation and microscopy slide review.

Results: One hundred ninety HCC recipients formed the study group. Fifty-nine grafts (31%) were from outside the local OPO (54 from region 3 and 5 national).The median waitlist time for HCC recipients at our center was 43 days (range 2-1,167 days). Demographic data are summarized in the Table. The 1- and 3-year patient and graft survivals for ILGs were comparable to local liver grafts (LLGs). The observed disease recurrence rate for LLG recipients was 11%, and for ILG it was 10%.

Conclusion: ILGs can result in comparable outcomes, and there appears to be no increased risk of HCC recurrence. Our outcomes demonstrate that a multimodal approach can maximize utilization of imported grafts.

Table. Demographic Data

	Local grafts (n=139)	Imported grafts (n=59)	P Value
Natural MELD (median)	11 (6-39)	12 (6-40)	
CIT (mean)	3.1 ± 2.00 hr	4.2 ± 2.4 hr	0.0009
Recipient age (median)	59 (39-75 years)	57 (37-73 years)	
Donor age (median)	43 (18-63 years)	43 (29-63 years)	

39 Increased Myeloid CD16 Expression Identifies Hepatocellular Carcinoma Patients With Favorable Imaging Response to DEB-TACE

Paul T. Thevenot, PhD[1], Kelley G. Núñez, PhD[1], Janet Gonzalez-Rosario, MD[1], Tyler Sandow, MD[2], Gretchen Galliano, MD[3], Dorota Wyczechowska, PhD[4], Augusto Ochoa, MD[4], Ari Cohen, MD[5,6]

[1]Institute of Translational Research, Ochsner Clinic Foundation, New Orleans, LA [2]Department of Radiology, Ochsner Clinic Foundation, New Orleans, LA [3]Department of Pathology, Ochsner Clinic Foundation, New Orleans, LA [4]Stanley S. Scott Cancer Center, Louisiana State University Health Sciences Center, New Orleans, LA [5]Multi-Organ Transplant Institute, Ochsner Clinic Foundation, New Orleans, LA [6]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Myeloid-derived suppressor cells (MDSCs) are immature myeloid cells with potent immunoregulatory activity arising as a product of cancer-specific myelopoiesis. MDSCs accumulate in the blood, lymphoid organs, and primary tumor site as a mixed population of granulocytic (PMN-MDSCs) and monocytic (Mo-MDSCs) cells, each with unique morphology, surface-expression profiles, and immunoregulatory programs. Mo-MDSCs predominate in early-stage cancers, while PMN-MDSC expansion often occurs in advanced stages. Mo-MDSC expansion in early-stage hepatocellular carcinoma (HCC) overlaps treatment algorithms where curative liver transplantation (LTx) remains a viable treatment option. Embolization strategies are routinely employed to downstage HCC for LTx waitlisting or as a bridge to LTx. The purpose of this study was to monitor MDSCs in HCC patients prior to DEB-TACE to test for correlation with radiologic assessment of tumor response after treatment as an additional index measure for HCC recurrence post-LTx.

Methods: Blood was collected before and $<$30 days after DEB-TACE (100-300 μm LC Bead containing 50-75 mg doxorubicin). Forty-eight DEB-TACE treatments were analyzed, 31 with available radiologic imaging response.

Results: The patient population was 66% male, with 74% having a hepatitis C history. $CD33^{+}HLA\text{-}DR^{LO}$ MDSCs were identified in all DEB-TACE patients, ranging from 1%-18% of leukocytes. MDSCs were negative for granulocytic markers CD66b and CD15, with most MDSCs coexpressing the Mo-MDSC marker CD14. Interestingly, a patient fraction had elevated levels of $CD16^{+}CD14^{NEG}$ MDSCs after exclusion of NK and T/B cell lineages. Elevated $CD16^{+}CD14^{NEG}$ MDSCs ($>$10% of MDSCs) were accompanied by decreased total number of MDSCs ($P<0.05$) and a favorable radiologic tumor response to DEB-TACE (complete response 11/18 vs 2/13). Furthermore, patients with $CD16^{+}CD14^{NEG}$ MDSCs had expansion of antitumor $CD16^{+}CD14^{NEG}$ $CD33^{+}$ $HLA\text{-}DR^{HI}$ monocytes.

Conclusion: Minimal MDSC expansion with the presence of $CD16^{+}CD14^{NEG}$ fractions in the MDSCs may identify HCC patients with a favorable response to DEB-TACE and possibly decreased recurrence risk post-LTx.

40 Preprocedure Il-6 Elevation Identifies Hepatocellular Carcinoma Patients With Poor Response to DEB-TACE

Paul T. Thevenot, PhD[1], Kelley G. Núñez, PhD[1], Janet Gonzalez-Rosario, MS[1], Tyler Sandow, MD[2], Gretchen Galliano, MD[3], Dorota Wyczechowska, PhD[4], Augusto Ochoa, MD[4], Ari Cohen, MD[5,6]

[1]Institute of Translational Research, Ochsner Clinic Foundation, New Orleans, LA [2]Department of Radiology, Ochsner Clinic Foundation, New Orleans, LA [3]Department of Pathology, Ochsner Clinic Foundation, New Orleans, LA [4]Stanley S. Scott Cancer Center, Louisiana State University Health Sciences Center, New Orleans, LA [5]Multi-Organ Transplant Center, Ochsner Clinic Foundation, New Orleans, LA [6]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Curative liver transplantation (LTx) remains a viable option for early-stage hepatocellular carcinoma (HCC). However, HCC recurrence remains challenging (50% 5-year recurrence rate) with ~5% recurrence risk within the first year after LTx. Though several models assess HCC recurrence risk post-LTx, most rely on post-LTx pathology to calculate the risk index (RI). Our group is developing a RI using patient response to DEB-TACE along with preprocedure immunophenotyping. Recently, a combination of DEB-TACE imaging response with primary HCC tumor diameter was proposed as a recurrence RI. We applied this index in 48 HCC patients eligible for LTx undergoing DEB-TACE to identify additional RI variables of recurrence risk.

Methods: Blood was collected before and $<$30 days after DEB-TACE (100-300 μm LC Bead containing 50-75 mg doxorubicin). Imaging response for 30 patients was available at analysis. Patients received a high-risk (HR) designation for disease progression after DEB-TACE upon radiologic evaluation and for primary tumor size $>$3 cm. Favorable or stable imaging assessment and primary tumor $<$3 cm received a low-risk (LR) designation.

Results: RI breakdown was as follows (modified RECIST [mRECIST]/tumor size): HR/HR - 6/30, HR/LR - 8/30, LR/HR - 5/30, and LR/LR - 11/30. An HR/HR designation accompanied a significant preprocedure elevation in interleukin 6 (IL-6) ($P<0.01$), a critical regulator of HCC tumor stem cell survival and HCC metastasis. Only 2/14 patients with IL-6 $>$15 ng/mL had a complete imaging response to DEB-TACE. We then stratified patients based on IL-6 $>$15 ng/mL and unfavorable imaging response of disease progression or stable disease. This patient subset had significantly decreased absolute lymphocyte counts ($P<0.05$), increased soluble CD163 levels ($P<0.05$), and the greatest change in myeloid-derived suppressor cells (MDSCs) during DEB-TACE follow-up.

Conclusion: Preprocedure inflammatory markers IL-6 and soluble CD163 with mRECIST and MDSC levels may help identify patients at high risk of HCC recurrence post-LTx who may require more aggressive therapy.

41 Myeloid-Derived Suppressor Cell Expansion in Patients With Transarterial Chemoembolization History

Paul T. Thevenot, PhD[1], Kelley G. Núñez, PhD[1], Janet Gonzalez-Rosario, MS[1], Tyler Sandow, MD[2], Gretchen Galliano, MD[3], Dorota Wyczechowska, PhD[4], Augusto Ochoa, MD[4], Ari Cohen, MD[5,6]

[1]Institute of Translational Research, Ochsner Clinic Foundation, New Orleans, LA [2]Department of Radiology, Ochsner Clinic Foundation, New Orleans, LA [3]Department of Pathology, Ochsner Clinic Foundation, New Orleans, LA [4]Stanley S. Scott Cancer Center, Louisiana State University Health Sciences Center, New Orleans, LA [5]Multi-Organ Transplant Institute, Ochsner Clinic Foundation, New Orleans, LA [6]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Cancer-specific myelopoiesis causes myeloid cell expansion and accumulation at the tumor site. Myeloid-derived factors negatively regulate antitumor immunity. Doxorubicin-eluting bead transarterial chemoembolization (DEB-TACE) can bridge hepatocellular carcinoma (HCC) patients with low-stage tumors to liver transplantation (LTx). Unfortunately, HCC recurrence rates remain high, with 5-year tumor-free survival rates estimated at ~50%. Though myeloid-derived suppressor cell (MDSC) expansion has been associated with tumor progression and recurrence risk, the effect of DEB-TACE on MDSCs is unclear. A pilot study of HCC patients with no response to DEB-TACE treatment revealed increased MDSCs in the blood accompanying elevations in HCC-progression associated factors, transforming growth factor beta (TGF-β) and interleukin 6 (IL-6). In this prospective study, we analyzed MDSC levels before and after DEB-TACE treatment in HCC patients waitlisted for LTx.

Methods: Blood was collected before and <30 days after DEB-TACE (100-300 μm LC Beads containing 50-75 mg doxorubicin). The DEB-TACE treatment breakdown was 48 total patients: 20 de novo (DN) and 28 previously embolized (PE).

Results: The patient population was 66% male, with 74% having a hepatitis C history. Primary tumor diameter was similar among DN and PE patients, although complete response to DEB-TACE treatment was more common in DN (53%) compared to PE (28%) patients. $CD33^{+}HLA\text{-}DR^{LO}$ MDSCs were elevated in PE patients both prior to ($P<0.05$) and following DEB-TACE ($P<0.05$) and were not affected by the number of prior DEB-TACE treatments or radiologic treatment response. PE patients with elevated MDSCs (>10% of leukocytes) had elevated TGF-β levels ($P<0.01$) and lower absolute lymphocyte counts ($P<0.05$), IL-6 ($P<0.01$), and the HCC recurrence–associated matrix metalloproteinase-2 ($P<0.05$) with no significant change in total leukocyte counts.

Conclusion: MDSC expansion in PE DEB-TACE patients is accompanied by several poor prognostic factors for aggressive HCC. Progressive MDSC expansion in DEB-TACE patients, particularly in reembolized patients, may provide an additional biomarker for identifying the risk of HCC recurrence post-LTx in the pre-LTx setting.

42 Bridging to Transplant: The Role of Immune Status in the Treatment Response of Hepatocellular Carcinoma to Chemoembolization

Tyler Sandow, MD[1], Stephen Arndt, MD[1], Paul Gulotta, MD[1], Humberto Bohorquez, MD[2,3], Paul T. Thevenot, PhD[4], Kelley G. Núñez, PhD[4], Daniel DeVun, MD[1,3], David Kirsch, MD[1,3], Juan Gimenez, MD[1], Patrick Gilbert, MD[1], Gretchen Galliano, MD[5], Ari Cohen, MD[2,3], Dennis Kay, MD[1,3], George Loss, MD, PhD[2,3]

[1]Department of Radiology, Ochsner Clinic Foundation, New Orleans, LA [2]Multi-Organ Transplant Institute, Ochsner Clinic Foundation, New Orleans, LA [3]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [4]Institute of Translational Research, Ochsner Clinic Foundation, New Orleans, LA [5]Department of Pathology, Ochsner Clinic Foundation, New Orleans, LA

Background: Immune factors are pivotal against disease progression after transplant in hepatocellular carcinoma (HCC). With chemoembolization (TACE) as a bridge to liver transplant, this study compared imaging response characteristics to TACE based on pretreatment immune markers, using explant pathology for confirmation of tumor biology.

Methods: Retrospective analysis was performed on all patients who were treated for HCC with TACE (100-300 μm LC Bead mixed with doxorubicin) from July 2011 to May 2016 and who were subsequently transplanted (n=93). Serum analysis was performed on the morning of TACE. Primary treatment response was based on modified RECIST criteria at 1-month follow-up imaging. Patients with a history of prior locoregional therapy were excluded from analysis. Posttreatment imaging response was compared with pretreatment laboratory markers and tumor biology. Eighty-two patients were followed after transplant (mean time of follow-up, 659 days).

Results: Pretreatment absolute lymphocyte counts (ALC) were lower in patients with stable disease (SD) at follow-up compared to patients with complete response (CR) or partial response (PR) (1.09 in SD vs 1.43 in CR/PR, $P=0.02$). ALC correlated with serum albumin at the time of TACE ($r=0.22$, $P=0.04$). ALC values did not correlate with tumor grade (G) (1.37 in G1/G2 vs 1.11 in G3/G4, $P=0.41$). However, lower pretreatment ALC values were associated with the presence of lymphovascular invasion (LVI) and/or satellite nodules (SN) at liver explant (1.05 vs 1.43, $P=0.01$). Posttransplant recurrence was identified in 7 patients. LVI and/or SN occurred in 71.4% with recurrence vs 25.3% without recurrence, $P=0.02$.

Conclusion: Unfavorable TACE treatment response was associated with low lymphocyte counts, a marker for immunosurveillance. Low ALC values were also associated with low serum albumin values. This suggests that an unfavorable treatment response and poor tumor biology may be associated with diminished immune and nutritional status, regardless of tumor grade, which could play a role in transplant bridging and posttransplant success.

43 Identifying Patients at Risk for Posttransplant Recurrence: The Response of Hepatocellular Carcinoma to Chemoembolization

Tyler Sandow, MD[1], Stephen Arndt, MD[1], Paul Gulotta, MD[1], Humberto Bohorquez, MD[2,3], Paul T. Thevenot, PhD[4], Kelley G. Núñez, PhD[4], David Kirsch, MD[1,3], Daniel DeVun, MD[1,3], Juan Gimenez, MD[1], Patrick Gilbert, MD[1], Gretchen Galliano, MD[5], Ari Cohen, MD[2,3], Dennis Kay, MD[1,3], George Loss, MD, PhD[2,3]

[1]Department of Radiology, Ochsner Clinic Foundation, New Orleans, LA [2]Multi-Organ Transplant Institute, Ochsner Clinic Foundation, New Orleans, LA [3]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [4]Institute of Translational Research, Ochsner Clinic Foundation, New Orleans, LA [5]Department of Pathology, Ochsner Clinic Foundation, New Orleans, LA

44 Increased Intraoperative Crystalloid Administration for Esophagectomy Decreases Unplanned Intensive Care Unit Admissions in a Single-Center Study

Jeffrey P. Cardinale, MD, PhD[1], Morgan T. Smith, MBBS[2], Philip G. Boysen, MD[1,2], Bobby D. Nossaman, MD[1,2]

[1]Department of Anesthesiology, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: The high risk of perioperative morbidity and mortality following esophageal resection is well known. The debate between restrictive vs liberal intraoperative crystalloid fluid administration for esophagectomy and postoperative complications remains in contention. Striking the correct fluid balance between adequate tissue perfusion and adverse outcomes is an important component of anesthetic management for this patient population. The present investigation aimed to highlight the role of intraoperative fluid management in decreasing unplanned intensive care unit (ICU) admissions and subsequent length of stay following esophagectomy.

Methods: Following institutional review board approval, data were extracted from the medical records of 99 consecutive patients undergoing esophagectomy to analyze the association of intraoperative crystalloid administration on the incidence of unplanned surgical ICU (SICU) admission, SICU duration of stay, and the incidence of long-term acute care (LTAC) admissions. Data were summarized as counts (%) and means with standard deviation and analyzed with Wilcoxon rank sum test set for statistical significance ($P<0.01$).

Results: In patients who received <6 L crystalloid fluid intraoperatively (n=57), 20 (35%) required unplanned SICU admission. In patients who received >6 L of intraoperative crystalloid, no patients experienced an unplanned SICU admission. Duration of postoperative length of SICU stay was also examined, and in patients who received <5.3 L of intraoperative crystalloid, SICU length of stay was 10 ± 13.4 days. Conversely, in patients who received >5.3 L of intraoperative crystalloid, length of SICU stay was 3 ± 3.5 days. Finally, the role of intraoperative crystalloid administration on the incidence of LTAC placement was examined, and 8 patients (14%) required LTAC placement, all of whom received <4.8 L of intraoperative crystalloid with a misclassification rate of 8% ($P=0.2679$).

Conclusion: Intraoperative fluid administration for esophageal resection surgery is an important component contributing to postoperative complications. These data suggest that a more liberalized approach to crystalloid management decreases unplanned SICU admissions, SICU length of stay, and LTAC placement.

45 Novel Opiate-Free Anesthesia for Major Urologic Oncology Procedures

Susan Smith, MD[1], Hussam Ghabra, MD[1], Daniah Dhaiffalah, MD[1], Alexander Rahnema, BSc[2], William M. White, MD[1], Bobby D. Nossaman, MD[1,2], William Sumrall, MD[1], Daniel Canter, MD[2,3], Michael Maddox, MD[1], Eric Laborde, MD[3], Bryan Evans, MD[1], Stephen Bardot, MD[3]

[1]Department of Anesthesiology, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [3]Department of Urology, Ochsner Clinic Foundation, New Orleans, LA

Background: Enhanced recovery pathways aim to more quickly return patients to their preoperative level of functioning than conventional strategies. We postulated that an opiate-free general anesthesia technique could facilitate recovery by avoiding opiate-related adverse effects. Our objective was to compare patients undergoing major urologic procedures with and without perioperative opiate-based general anesthetic.

Methods: An institutional review board-approved study was performed evaluating the effectiveness of an opiate-free anesthetic protocol that started at our institution in October 2015. A propensity-matched analysis was performed comparing hospital length of stay (hLOS) and postanesthesia care unit (PACU) opiate consumption. Data were expressed as medians with 25%-75% interquartile ranges and analyzed with Wilcoxon rank sum test. P values <0.05 indicate statistical significance.

Results: One hundred sixty-seven patients in the opiate-free treatment arm were matched to 167 patients in the opiate-based control arm. Median age was 64.4 years (range, 57.2-68.3) for treatment vs 64.9 years (range, 57.7-68.6) for control ($P=0.8970$). Median hLOS for the treatment group was 1.36 days (range, 1.23-2.28) vs 1.27 days (range, 1.18-2.27) for the control group ($P=0.5944$). Median intravenous morphine equivalent consumption in the PACU was 7.67 mg (range, 5-11.67 mg) for the treatment group vs 11.67 mg (range, 5-17.26 mg) for the control group ($P>0.0001$).

Conclusion: This retrospective study showed a statistically significant difference in opiate consumption in the PACU for patients who underwent our opiate-free technique vs the conventional opiate-based technique, with no difference in hLOS. This technique can be used as an alternative to conventional opiate-based anesthetic techniques without major untoward consequences.

46 A Decision Tree to Improve Antibiotic Stewardship in the Surgical Intensive Care Unit

William M. White, MD[1], Hussam Ghabra, MD[1], Daniah Dhaiffalah, MD[1], Ngoc Vu, PharmD[2], Katherine Jennings, PharmD[2], Joshua Goldberg, MD[3,4], Michael Townsend, MD[3,4], Phillip G. Boysen, MD[1,4], Bobby D. Nossaman, MD[1,4]

[1]Department of Anesthesiology, Ochsner Clinic Foundation, New Orleans, LA [2]Department of Pharmacy, Ochsner Clinic Foundation, New Orleans, LA [3]Department of Surgery, Ochsner Clinic Foundation, New Orleans, LA [4]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Recent studies have shown that classical measures for suspected infection and admission biomarkers, such as procalcitonin and lactate, are insufficient in the postsurgical setting. However, combinations of these admission variables may predict infection. This prospective observational study examined these admission variables for suspected infection in terms of the incidence of culture-proven infection in the surgical intensive care unit (SICU).

Methods: Following institutional review board approval, admission procalcitonin and lactate levels, body temperature, WBCs, and absolute and percentage lymphocyte counts were obtained in 114 consecutive postsurgical patients admitted for suspected infection. Data were measured and expressed as counts (%) or medians (25%-75% interquartile range, IQR) with analysis utilizing Wilcoxon rank sum test and statistical significance set at $P<0.01$ to reduce the incidence of false discovery rates (FDRs). A decision tree with 5-fold internal cross-validation was generated for these admission variables with LogWorth values ≥ 2.0 to indicate statistical significance when $P<0.01$. The diagnostic sensitivity of the decision tree was analyzed with C-index statistics.

Results: The incidence of culture-proven infection following SICU admission was 45%. Postoperative infection increased SICU length of stay from 4 (2-6) days to 6 (2-12) days ($P=0.0449$) and hospital length of stay from 12 (7-22) days to 19 (9-25) days ($P=0.0246$). When admission procalcitonin values were ≥ 2.9 ng/mL (LogWorth=7.6) and admission lymphocyte counts were <300/mL (LogWorth=3.6), all patients developed culture-proven infection (FDR=2.1%). In contrast, when admission procalcitonin values were <2.9 ng/mL and associated lactate values were ≤ 1.2 mmol/L, no patient developed culture-proven infection (LogWorth=3.0, FDR=3.1%). Admission variables such as body temperature, WBC, and percentage lymphocyte counts were not predictive in this analysis. The diagnostic sensitivity of the decision tree was C-index=0.83.

Conclusion: This novel study suggests that a decision tree provides important clinical information in predicting culture-proven infection in the SICU. The observed low FDR, once confirmed with external validation studies, supports development of a protocol to improve antibiotic stewardship.

47 Role of Left Ventricular Ejection Fraction in Causation of Contrast-Induced Nephropathy in Patients Undergoing Transcatheter Aortic Valve Replacement

Loui Rejjal, MD[1], Fahad Javed, MD[2], Omar Aldibasi, MPH[3], Ahlam Alzenaidi, MD[1], Jose Tafur Soto, MD[2], Alexandre Benjo, MD[2], Stephen Ramee, MD[2]

[1]Department of Internal Medicine, Ochsner Clinic Foundation, New Orleans, LA [2]Department of Cardiology, Ochsner Clinic Foundation, New Orleans, LA [3]School of Public Health, Louisiana State University Health Sciences Center, New Orleans, LA

Background: Contrast-induced nephropathy (CIN) is a major concern in patients undergoing transcatheter aortic valve replacement (TAVR). Recent studies have shown that the CIN is associated with poor prognosis and higher mortality rate in postoperative TAVR patients. There are limited data on the association of CIN with the left ventricular ejection fraction (LVEF) in patients undergoing TAVR. We hypothesized that the risk of CIN increases with lower LVEF.

Methods: We conducted a retrospective study of 80 patients who underwent TAVR in a large tertiary center. An echocardiogram was done to assess LVEF 1-3 months prior to TAVR. Patients were segregated into 2 groups: group 1 was heart failure with preserved ejection fraction (HFpEF) - LVEF $>50\%$, and group 2 was heart failure with reduced ejection fraction (HFrEF) - LVEF $<50\%$. Preprocedure CIN risk was calculated using Mehran risk score along with actual incidence of CIN. Regression analysis was used to estimate the association between CIN and LVEF.

Results: There were no significant differences in the baseline characteristics between groups. The mean age was 78.18 ± 9.53 years with no difference between groups ($P=0.51$). The mean LVEF was significantly higher in the HFpEF group than the HFrEF group (54.5% vs 39.9%, $P=0.003$). The mean Mehran risk score for CIN in patients with LVEF $<50\%$ and $>50\%$ was 11.34 ± 4.64 and 11.59 ± 3.97, respectively ($P=0.32$). When the CIN risk was plotted against LVEF as a continuous variable, there was no statistically significant difference between groups ($P=0.115$).

Conclusion: LVEF was not found to be associated with CIN in patients who underwent TAVR. Our results indicate that there is no or minimal role of LVEF in prediction of CIN risk in patients undergoing TAVR.

48 Use of Gene Expression Profiling Score Variability to Predict Cardiac Allograft Vasculopathy: A Single-Center Experience

Loui Rejjal, MD[1], Omar Aldibasi, MPH[2], Sanbir Sidhu, MD[1], Stefany Ware, LPN[3], Raylene Vasquez, BS[3], Debra Dumas-Hicks, BS[3], Sapna Desai, MD[3], Hector Ventura, MD[3,4], Selim Krim, MD[3,4]

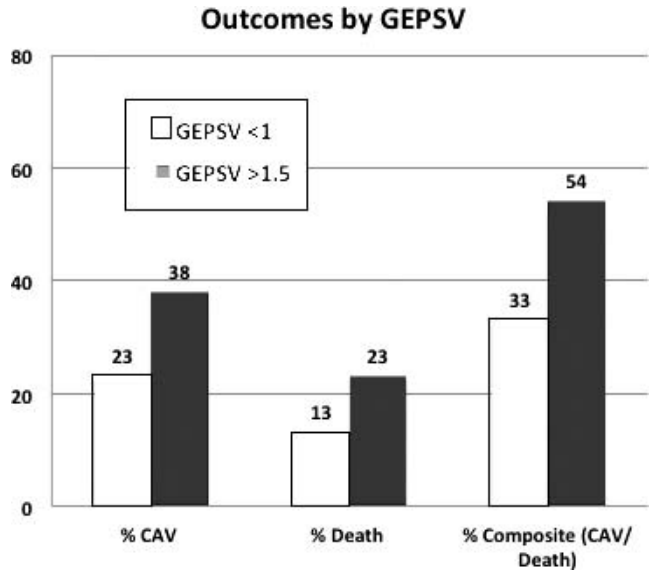
[1]Department of Internal Medicine, Ochsner Clinic Foundation, New Orleans, LA [2]School of Public Health, Louisiana State University Health Sciences Center, New Orleans, LA [3]Department of Cardiology, Ochsner Clinic Foundation, New Orleans, LA [4]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Gene expression profiling (GEP) test (AlloMap) is now routinely used in the screening of cellular rejection in low-risk cardiac transplant patients. More recently, studies suggested that the variability of GEP test scores in a patient may be associated with long-term outcomes, including death and allograft dysfunction in cardiac transplant patients. We hypothesized that GEP score variability (GEPSV) can predict cardiac allograft vasculopathy (CAV).

Methods: Fifty-nine cardiac transplant patients from a single center who underwent rejection surveillance with GEP tests performed at 1- to 6-month intervals were included in the study. GEPSV was defined as the standard deviation of an individual's 4 cumulative test scores all obtained after 1 year posttransplantation. The correlation between GEPSV and CAV was evaluated by using the odds ratio of a simple logistic regression model. Secondary outcomes included death and composite CAV/death.

Results: Mean age was 53.63 $\pm$ 13.2 years. Sixty-one percent were male, and 62% were white. Mean GEPSV was 1.17 $\pm$ 0.647. Seventeen patients (29%) had CAV. At baseline, no significant differences with regards to age, gender, or ethnicity were noted between the CAV and non-CAV groups. CAV was less common among patients with a GEPSV $<$1. CAV, and mortality was higher among patients with a GEPSV $>$1.5 (Figure). There was also a nonstatistically significant positive association between GEPSV and CAV (OR 2, 95% CI: 0.791-5.055, P=0.142).

Conclusion: In this small cohort of cardiac transplant patients, GEPSV had a nonsignificant positive association with CAV. Additionally, patients with a GEPSV $>$1.5 were more likely to have CAV compared to patients with a GEPSV $<$1.



49 Search for the Super-Responder: Progressive Increases in Fitness and an Association With Lower Mortality

Sergey Kachur, MD[1], Amy McNeill, PhD[2], Kelly Shum, MD[3,4], Alban DeSchutter, MD[5], Carl J. Lavie, MD[3,4], Ross Arena, MD[6], Richard Milani, MD[3,4]

[1]Graduate Medical Education, Ocala Regional Medical Center, Ocala, FL [2]Department of Kinesiology and Nutrition, University of Illinois at Chicago, Chicago, IL [3]Department of Cardiology, Ochsner Clinic Foundation, New Orleans, LA [4]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [5]Leon H. Charney Division of Cardiology, New York University School of Medicine, New York, NY [6]Department of Physical Therapy, University of Illinois at Chicago, Chicago, IL

Background: The relationship between increasing cardiorespiratory fitness (CRF) and improved survival is well-documented. Here, we examine an optimum threshold of CRF improvement to find super-responders and the baseline traits associated with this group.

Methods: A total of 1,110 subjects with stable coronary heart disease referred for cardiac rehabilitation (CR) between January 2000 and June 2013 with a mean follow-up of 6.3 years were analyzed using ROC **analysis** to find the point of maximal sensitivity and specificity for predicting mortality. Mortality from the cohort was analyzed with respect to change in CRF with CR, as well as body mass index, initial CRF, age, ejection fraction, and sex. Logistic regression was performed on the super-responder group (SGG, N=446) to determine significant associations.

Results: ROC analysis of ΔCRF as a test for mortality yielded a threshold of +2.85 $mLO_2.kg^{-1}.min^{-1}$ maximal oxygen consumption (VO_2) (sensitivity 75.4%, specificity 46.5%). Dividing patients at this threshold resulted in mortality of 7.2% for the SGG, 17.2% for low responders, and 23% for nonresponders ($P<0.001$ using ANOVA). In multivariate analysis, the SGG had a significantly lower mortality association than both the low responder and nonresponder groups (HR 0.51, $P<0.001$; HR 0.3, $P<0.001$, respectively). Makeup of the SGG cohort was associated with younger age, an absence of depression, male sex, and lower baseline lean mass and CRF ($P<0.05$ for all).

Conclusion: Patients who achieve an increase in CRF in excess of 2.85 $mLO_2.kg^{-1}.min^{-1}$ after CR have an independent association with increased survival in comparison with those who achieve less improvement. Surprisingly, this group has lower baseline lean mass and CRF, which contradicts the previously established beneficial associations with mortality of these independent factors. Future work should focus on the interplay between these factors and their effects on mortality.

50 Fitness and the Obesity Paradox in Cardiac Rehabilitation–How Does Weight Loss Factor In?

Sergey Kachur, MD[1], Kelly Shum, MD[2,3], Alban DeSchutter, MD[4], Michael Morledge, MBBS[3], Carl J. Lavie, MD[2,3], Ross Arena, MD[5], Richard Milani, MD[2,3]

[1]Graduate Medical Education, Ocala Regional Medical Center, Ocala, FL [2]Department of Cardiology, Ochsner Clinic Foundation, New Orleans, LA [3]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [4]Leon H. Charney Division of Cardiology, New York University School of Medicine, New York, NY [5]Department of Physical Therapy, University of Illinois at Chicago, Chicago, IL

Background: Weight loss (WL) confers benefits to insulin resistance and cardiovascular (CV) events and is a hallmark of most successful exercise programs, but WL in a chronic disease population can also be a sign of progressive frailty. Recent work in the obesity paradox finds that the protective associations of body mass index (BMI) and body fat are inversely related to cardiorespiratory fitness (CRF). We explore the mortality effects of WL in a population stratified by degree of increase in CRF (ΔCRF).

Methods: A total of 1,110 subjects with stable coronary heart disease (CHD) referred for cardiac rehabilitation between January 2000 and June 2013 with a mean follow-up of 6.3 years were stratified based on median ΔCRF and median WL. Mortality in this cohort was analyzed with respect to change in weight, BMI, initial CRF, age, ejection fraction, and sex.

Results: The 4 groups after stratification were high WL and ΔCRF (N=68), low WL and ΔCRF (N=632), high WL and low ΔCRF (N=140), and low WL and high ΔCRF (N=328). Both groups with low ΔCRF had a higher mortality (low WL, HR 3.32, $P=0.04$; high WL, HR 3.9, $P=0.02$) in comparison with the high WL and high ΔCRF group. When comparing WL within ΔCRF subgroups, the mortality differences were negligible in both the high ΔCRF subgroups (low WL 7.8%, high WL 4.5%, $P=0.3$) and low ΔCRF subgroups (low WL 18.9%, high WL 19.9%, $P=0.8$).

Conclusion: Despite WL playing a prominent role in reducing morbidity in healthy populations, the associations of WL and mortality across changes in CRF in a CHD population are negligible. This may suggest that benefits derived in the healthy population are the result of increased CRF rather than changes in weight and that WL may be a barometer of increases in CRF rather than an independent factor in disease modification.

51 Weight Changes During Cardiac Rehabilitation in Patients With Coronary Heart Disease Do Not Impact Long-Term Mortality

Sergey Kachur, MD[1], Kelly Shum, MD[2,3], Alban DeSchutter, MD[4], Michael Morledge, MBBS[3], Carl J. Lavie, MD[2,3], Ross Arena, MD[5], Richard Milani, MD[2,3]

[1]Graduate Medical Education, Ocala Regional Medical Center, Ocala, FL [2]Department of Cardiology, Ochsner Clinic Foundation, New Orleans, LA [3]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [4]Leon H. Charney Division of Cardiology, New York University School of Medicine, New York, NY [5]Department of Physical Therapy, University of Illinois at Chicago, Chicago, IL

Background: Guidelines for the secondary prevention of coronary heart disease (CHD) emphasize lifestyle changes that include weight loss (WL), which confers benefits to insulin resistance and potentially on cardiovascular (CV) events. However, the obesity paradox would imply that WL may be detrimental to long-term survival. We examine the effects of WL during cardiac rehabilitation (CR) on mortality in a population with CHD.

Methods: A total of 1,118 subjects with stable CHD referred for CR between January 2000 and June 2013 with a mean follow-up of 6.3 years were stratified based on absolute and percent body WL. Mortality from the cohort was analyzed with respect to change in weight, body mass index (BMI), initial cardiorespiratory fitness, age, ejection fraction, and sex.

Results: Absolute WL was not associated with a significant change in mortality (HR 1.01, $P=0.3$). Likewise, when WL was assessed in groups comparing WL by quartile to those with weight gain, there were no significant differences in mortality between these groups ($P>0.5$ for all). When WL was assessed as a percentage of body weight, there were again no significant associations with mortality either as a continuous variable ($P=0.17$) or when divided by quartiles of percent WL ($P>0.4$ for each).

Conclusion: Despite having a favorable effect on CV risk factors, WL during CR does not appear to carry a mortality association in a CHD patient population. This may be associated with changes in BMI that modify the interaction through mechanisms of the obesity paradox and likely stems from an interaction between WL and fitness that will need to be explored further.

52 Reduced Flow Capacity as Measured by Cardiac Positron Emission Tomography Predicts Ventricular Tachyarrhythmia in Patients With an Implantable Cardioverter Defibrillator

Todd M. Rosenthal, MBBS[1], Daniel Masvidal, MD[1], Freddy M. Abi-Samra, MD[1], Michael L. Bernard, MD, PhD[1], Sammy Khatib, MD[1], Glenn M. Polin, MD[1,2], Paul A. Rogers, MD, PhD[1], Robert M. Bober, MD[1,2], Daniel P. Morin, MD, MPH[1,2]

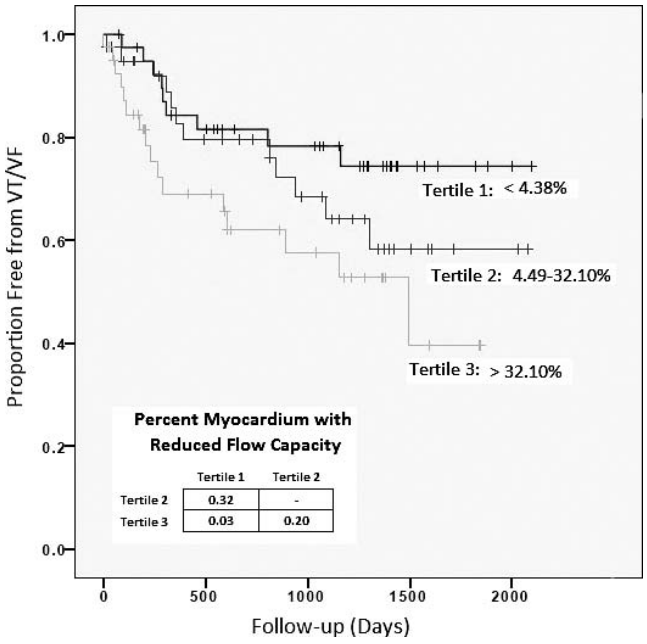
[1]Department of Cardiology, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Our ability to predict life-threatening ventricular tachyarrhythmias (VT/VF) remains unsatisfactory. Myocardial flow capacity (FC) is a novel metric that integrates myocardial perfusion, absolute rest myocardial flow, absolute stress myocardial flow, and coronary flow reserve. The predictive ability of FC as assessed by cardiac positron emission tomography (PET) is unknown.

Methods: We enrolled sequential patients with an implantable cardioverter defibrillator (ICD) who underwent cardiac PET stress imaging. Absolute myocardial flow was quantified in mL/min/g. Reduced FC in the definite ischemic zone was defined as both stress myocardial blood flow $<$0.91 mL/min/g and coronary flow reserve $<$1.74. Patients were prospectively followed for VT/VF via periodic device interrogation. Patients were stratified by tertiles of percent myocardium with severely reduced flow capacity, and outcomes were assessed with the log-rank test.

Results: There were 120 patients (67 $\pm$ 12 years, 78% male, LVEF 31 $\pm$ 13%, 76% with macroscopic CAD) who met inclusion criteria. Over 32 $\pm$ 19 months, there were 41 VT/VF events. Increased percentage of myocardium with severely reduced FC predicted VT/VF (HR per 5% increase: 1.06, CI 1.01-1.12, P=0.02). As shown in the Figure, patients in the lowest tertile ($<$4.4% of myocardium with reduced FC) had fewer events than those in the highest tertile ($>$32.1%), P=0.03.

Conclusion: Reduced myocardial flow capacity as measured by cardiac PET imaging predicts VT/VF in patients with an ICD.



53 In Nonischemic Cardiomyopathy, Positron Emission Tomography Stress Myocardial Blood Flow Predicts Ventricular Tachyarrhythmia

Todd M. Rosenthal, MBBS[1], Daniel Masvidal, MD[1], Freddy M. Abi-Samra, MD[1], Michael L. Bernard, MD, PhD[1], Sammy Khatib, MD[1], Glenn M. Polin, MD[1,2], Paul A. Rogers, MD, PhD[1], Robert M. Bober, MD[1,2], Daniel P. Morin, MD, MPH[1,2]

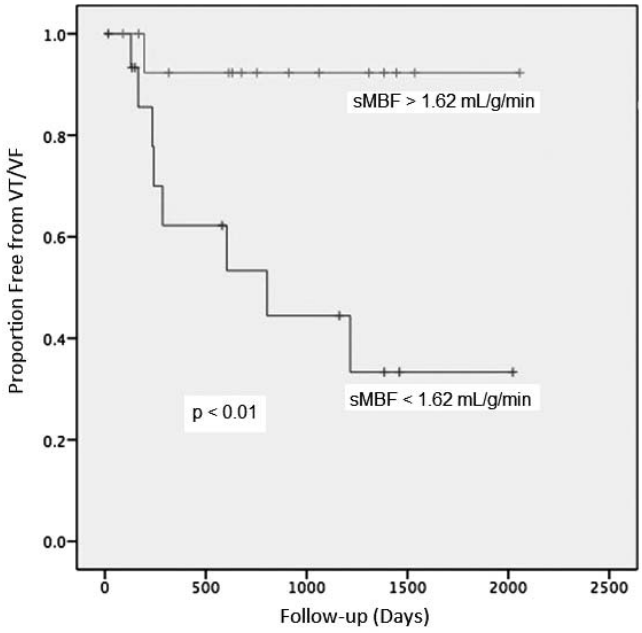
[1]Department of Cardiology, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: For patients with nonischemic cardiomyopathy (NICM), the benefit of implantable cardioverter defibrillators (ICDs) may be less clear than it is for those with ischemic cardiomyopathy. Thus, further risk stratification for ventricular tachyarrhythmia (VT/VF) may be particularly important in NICM. Some evidence exists that stress myocardial blood flow (sMBF) measured by positron emission tomography (PET) predicts adverse cardiac events. Whether PET-derived sMBF predicts VT/VF in patients with NICM is unknown.

Methods: We evaluated patients with NICM and an implanted ICD who underwent cardiac PET stress imaging. NICM was defined as the absence of coronary angiographic stenosis >70% (or left main >50%), absence of relative perfusion defects on imaging, and no history of coronary revascularization or acute coronary syndrome. Absolute myocardial blood flow was quantified in mL/min/g. Patients were prospectively followed for VT/VF via periodic device interrogation and were stratified at the median of whole-heart sMBF. Outcomes were compared with the log-rank test.

Results: Among the 31 patients (60 ± 14 years, 52% male, LVEF 25 ± 9%), the median sMBF was 1.62 mL/g/min (IQR, 1.06-1.98). Over 30 ± 20 months of follow-up, 9 patients had VT/VF. As seen in the Figure, patients whose sMBF was below the median had significantly more VT/VF than those with sMBF above the median ($P<0.01$).

Conclusion: In patients with NICM and an ICD, lower whole-heart sMBF, as measured by cardiac PET imaging, strongly predicts VT/VF.



54 Incidental Extracardiac Findings Present on Computed Tomography Angiography for Transcatheter Aortic Valve Replacement Evaluation: Prevalence and Implications

Yamini Rao, MBBS[1], Jessica Record, MD[2], James Murray, MD[2], Charles Matthews, MD[1,2], Stephen Ramee, MD[3], Rajan Patel, MD[1,3]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Department of Radiology, Ochsner Clinic Foundation, New Orleans, LA [3]Department of Cardiology, Ochsner Clinic Foundation, New Orleans, LA

Background: Transcatheter aortic valve replacement (TAVR) is an alternative to surgical valve replacement for patients with severe aortic stenosis. Computed tomography angiography (CTA) of the chest, abdomen, and pelvis has a critical role in selecting patients and in preprocedural planning for TAVR. This evaluation includes assessment and measurement of aortic root and iliofemoral arteries used to determine feasibility of the procedure, select a strategy for access, and size the transcatheter heart valve. Anecdotally, numerous incidental findings, many of which require further follow-up, are present on these CTAs of elderly patients with numerous comorbidities. The objective of this study was to determine the prevalence of significant extracardiac findings on CTA scans performed for TAVR and the prevalence of findings requiring further evaluation.

Methods: Radiology reports from CTAs performed for TAVR workup were reviewed from 2009 to 2016. A total of 1,273 patients meeting inclusion criteria were identified. Significant extracardiac findings, recommendations for follow-up, and basic demographic data were obtained. Significant findings included pulmonary nodules >0.5 cm, emphysema, interstitial lung disease, pleural effusions, aneurysms, dissections, and lymph nodes >1.5 cm.

Results: Mean patient age was 70.9 $\pm$ 10 years. Fifty-one percent of patients were female, and 49% were male. Pulmonary findings were the most common, seen in 45.5% of patients, including pleural effusions (25.1%) and lung nodules (20.3%). Pulmonary nodules were also the most common finding needing follow-up, found in up to 20.3% of the evaluated patients. Gastrointestinal findings were also common, seen in 28.2% of patients, most commonly hernias and diverticulosis.

Conclusion: A considerable number of incidental extracardiac findings were identified in patients undergoing TAVR workup CTAs, many requiring further evaluation. This study will serve to establish the prevalence and natural history of these incidental findings in this elderly population.

55 Code STEMI Initiative

Belinda Mounce, RN

Cardiac Catheterization Laboratory, Ochsner Medical Center Baton Rouge, Baton Rouge, LA

Background: Prolonged D2B times related to factors such as staffing, situations, and time of day were noted. Problem areas included triage, timely EKGs, AMI recognition, contacting cardiology, initiating and arrival of catheterization team, STEMI orders, CCL transport, initiating CCL equipment and patient information, and preparation. Also, Epic created delays relating to patient registration, catheterization orders, creating cases, and CVIS interfaces.

Methods: An AMI function team was created and met monthly to review STEMI cases. A STEMI flow sheet was developed to document the timeline. Depending on the situation, D2B results varied from <90 minutes to >90 minutes. STEMIs were reviewed, and minutes were tracked. The initial goal was for the patient to remain in the ED not >20 minutes prior to transport to CCL. Each step was reviewed, and the process was streamlined. An in-house code STEMI team was created. Key players were solicited and trained on actions to facilitate the patient transfer from the ED to the CCL. Consistently, lower D2B times were noted.

Results: We initially saw improvements, with most D2Bs being in the 50- to 70-minute range. Some D2Bs were in the 30-minute range during the day when key players were present. Further, streamlining the flow and creating solid processes for each step in patient care yielded more consistent and narrower margins in our D2B times. In 2015, the average D2B time was reduced to 63 minutes. In 2016, the average D2B time was further reduced by 6 minutes to 57 minutes.

Conclusion: By understanding and solidifying each step of the process, from ED presentation to balloon inflation in CCL, undesired outcomes were reduced. Excellence is an ongoing process. In our 2017 AMI team kickoff meeting, we are already seeking possibilities to further reduce our D2B time.

56 Barriers to Participation in Exercise Therapy for Peripheral Arterial Disease

Tripti Gupta, MD[1], Jessica Henry, BSN[2]

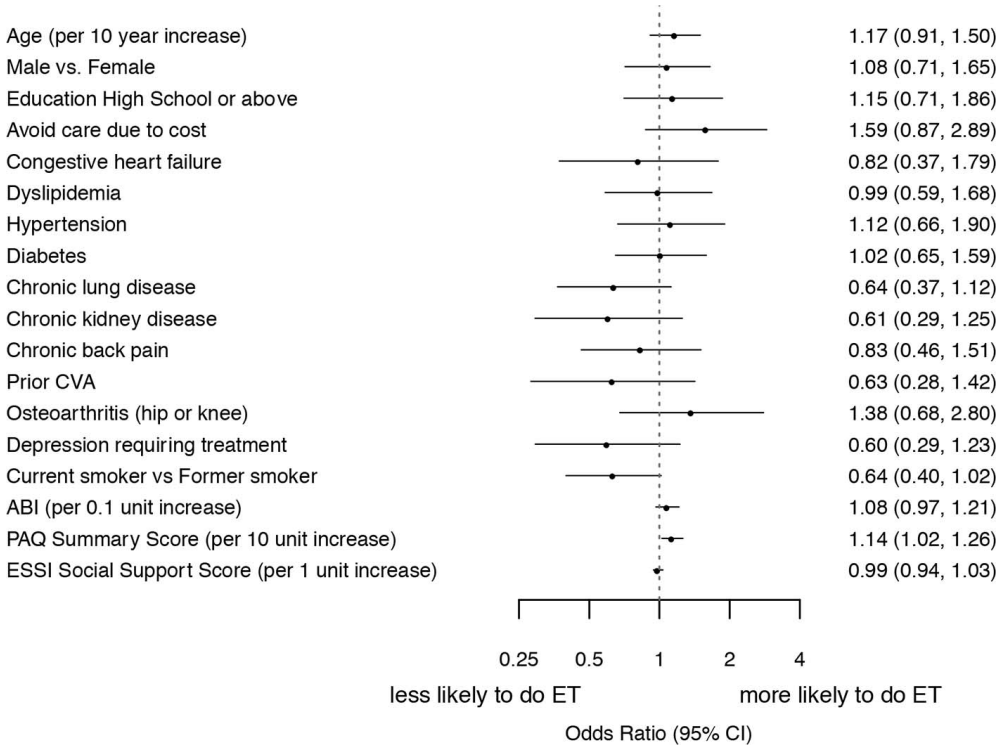
[1]*Department of Internal Medicine, Ochsner Clinic Foundation, New Orleans, LA* [2]*Department of Cardiology Research, Ochsner Clinic Foundation, New Orleans, LA*

Background: Exercise therapy (ET) is recommended for patients with peripheral arterial disease (PAD) symptoms. It is unclear, in those who get referred, how many participate and what patient factors correlate with ET participation.

Methods: Patients from 16 PAD clinics with new or an exacerbation of PAD symptoms were enrolled in an observational study June 2011 through October 2015. Comorbidities and ET referral were obtained from medical records. Interviews were conducted at baseline and at 3 months to obtain socioeconomic, psychosocial, health status (measured by the PAQ), and ET participation information. A multivariable logistic regression model for ET participation was constructed with 20 a priori chosen descriptors.

Results: Of 1,275 patients, 52.1% (N=666) were referred to ET, but only 41% of these participated at 3 months. Women vs men were less likely to participate (34.8% vs 65.2%, P=0.01). Patients with the following comorbidities vs those without were also less likely to participate: heart failure (13.7 vs 3.7%, $P<0.001$), diabetes (25.3% vs 35.9%, P=0.003), and chronic kidney disease (5.5% vs 15.0%, $P<0.001$). Patients who participated vs those who did not had higher PAQ mean summary scores (58 $\pm$ 19 vs 49 $\pm$ 22). After adjustment, higher PAQ summary scores were associated with ET participation (OR 1.14) (Figure).

Conclusion: More than half of patients with PAD referred to ET did not participate, with less use by those with a lower health status. Additional strategies to help support patients succeed with ET may be indicated.



57 Chronic Obstructive Pulmonary Disease Patients Transition of Care—Factors Associated With Emergency Department Utilization

Derek Corpus, BS[1], Mariella Gastanaduy, MPH[2], Eboni Price-Haywood, MD, MPH[1,2]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Center for Applied Health Services Research, Ochsner Clinic Foundation, New Orleans, LA

Background: Chronic obstructive pulmonary disease (COPD) is the fourth leading cause of morbidity and mortality worldwide. COPD exacerbations create major social and economic burdens related to impaired quality of life and the need for high-cost acute care. High-quality chronic disease management, preventive health maintenance, and postacute care transitions can reduce the risk of multiple exacerbations. We examined characteristics of patients with COPD-related hospital admissions and explored factors associated with emergency department (ED) utilization rates.

Methods: We conducted a retrospective observational study of COPD patients admitted to Ochsner Health System between 2012 and 2016. We conducted bivariate and multivariate regression with stepwise selection to examine the relationship between ED visit rates and covariates of interest (age, race, insurance, flu vaccine, body mass index [BMI], tobacco status, outpatient, and hospital discharge medications [meter-dosed inhalers, glucocorticosteroids], presence of postdischarge care transition calls, case management, primary care [PCP], and hospital visit rates).

Results: Among the 2,262 eligible patients, most were age 65+ years (58%), female (59%), and white (73%). The rate (mean, SD) of COPD-related hospitalization was 1.4 (0.9) and ranged from 1 to 15. Fifty-three percent of hospital admissions (N=3,056) had the highest severity of illness ratings (major to extreme) with 35% having postdischarge care transition calls. Only 120 patients were enrolled in case management. All-cause ED visit rate averaged 3.8 (4.5) and ranged from 1 to 67. In the multivariate analysis, only older age, minority race, outpatient steroid use, PCP visits, and prior hospitalization rates were significantly associated with ED utilization rates (estimates, SE: -0.9 [0.4]; 1.4 [0.4]; -1.2 [0.5]; 0.1 [0.02]; and 1.0 [0.2] respectively, all $P<0.03$). Other factors were not significantly associated with ED use.

Conclusion: Our study identified positive and negative relationships between select factors and ED utilization. Further studies should examine which factors are associated with COPD hospital admissions through the ED and 30-day hospital readmission rates.

58 Fall Prevention and Management in Primary Care

Mariella Gastanaduy, MPH[1], Eboni Price-Haywood, MD, MPH[1,2]

[1]Center for Applied Health Services Research, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Increased risk for falls and the potential sequelae in the geriatric population (eg, fractures) are a major public health concern. Clinical practice guidelines recommend screening patients who are ≥65 years for falls and implementing processes of care to reduce fall risks. We conducted this retrospective observational study to examine guideline adherence, identify care gaps, and recommend improvement strategies.

Methods: We conducted a chart review of Medicare patients (age 65+) seen at least twice within primary care at Ochsner Health System (OHS) between 2014 and 2016. We assessed whether patients were screened for falls. Among patients with documented falls, we assessed whether patients were screened for known risk factors and whether providers implemented fall prevention strategies (reduced high-risk medications [eg, antipsychotics, benzodiazepines, sedative-hypnotics, narcotics] or ordered vision screening/physical therapy) or implemented fracture risk-reducing strategies (vitamin D supplementation). We then compared demographics and rates of fall risk mitigation among patients who underwent an annual health risk assessment visit (cases) vs those who did not (controls) using *t* tests and chi-square test/Fisher exact test.

Results: Among 38,122 eligible patients, 89.5% were screened for falls, and 2,989 had documented falls (225 cases; 2,764 controls). Among patients with a history of falls, the mean age was 78.6 years, and most were female (65%) and Caucasian (75%). There were no significant between-group differences in mean age, gender, race, number of high-risk medications (cases vs control, mean [SD]: 3.6 [4.4] vs 3.4 [4.6]) or the percentage of patients having at least 1 vitamin D order (11.5% vs 13.3%). However, a larger proportion of cases received at least 1 vision/physical therapy referral than controls (19.1% vs 13.9%, $P=0.03$).

Conclusion: Increased primary care provider awareness of fall prevention clinical guidelines and translation into practice are warranted.

59 The Role of Bowel Preparation in Colorectal Surgery: Results of the 2012-2015 American College of Surgeons National Surgical Quality Improvement Program Data

Aaron Klinger, MD[1], David Beck, MD[1,2], Heather Green, MS[1], Terrell Hicks, MD[1,2], Brian Kann, MD[1,2], H. David Vargas, MD[1], Charles Whitlow, MD[1,2], David Margolin, MD[1,2]

[1]Department of Colon and Rectal Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Despite literature suggesting that mechanical bowel preparation (MBP) does not reduce infection rate, its use still remains common practice. The use of oral antibiotic bowel preparation (ABP) has shown more promise but is still not standard practice. We hypothesized that there is a significant benefit with regard to infectious complications with combined use of mechanical and antibiotic preparation in elective colorectal resections.

Methods: Patients undergoing elective colorectal resection included in the 2012-2015 Colectomy Procedure-Targeted Databases from American College of Surgeons National Surgical Quality Improvement Program were analyzed and grouped based on use of ABP, MBP, both, or no bowel preparation. Statistical analysis was performed to determine the association between preparation type and 30-day outcomes.

Results: Of the 23,431 patients analyzed, 6,050 received no preparation, 7,111 received MBP only, 1,010 received ABP, and 9,534 received both preparations. Compared to patients receiving no preparation, those receiving combined preparation had less superficial surgical site infection (SSI) (5.83% vs 2.40%, $P<0.0001$), deep SSI (1.06% vs 0.48%, $P<0.0001$), organ-space infection (4.53% vs 2.45%, $P<0.0001$), and wound dehiscence (0.83% vs 0.39%, $P=0.0003$). Compared to MBP alone, combined preparation resulted in less superficial SSI ($P<0.0001$), deep SSI ($P=0.0126$), organ-space infection ($P<0.0001$), and dehiscence ($P=0.0074$). ABP alone resulted in lower rates of superficial SSI than no preparation (4.26% vs 5.83%, $P=0.0437$). When looking at the effect of bowel preparation by location, we found combined preparation to be superior for both colon and rectal surgery. MBP alone reduced organ-space infection in colon but not rectal resection.

Conclusion: Combined MBP/ABP resulted in significantly lower rates of SSI, organ-space infection, and wound dehiscence than no preparation or MBP alone. For patients undergoing colon or rectal resection, we recommend bowel preparation with both mechanical agents and oral antibiotics.

60 Does Leaving Skin Open Following Elective Colorectal Resection Improve Outcomes? An Analysis of the American College of Surgeons National Surgical Quality Improvement Program 2014-2015 Data

Aaron Klinger, MD[1], David Beck, MD[1,2], Heather Green, MS[1], Terrell Hicks, MD[1,2], Brian Kann, MD[1,2], H. David Vargas, MD[1], Charles Whitlow, MD[1,2], David Margolin, MD[1,2]

[1]Department of Colon and Rectal Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Surgical site infection (SSI) is the most frequent nosocomial infection in surgical patients. Colectomy patients have an increased risk for SSI compared to other abdominal surgical patients. Trauma literature has shown that closing only the deep layers (fascia) and leaving the superficial (skin) wound open result in a lower rate of infectious complications. We hypothesized that this would hold true for elective colorectal surgeries.

Methods: Patients were selected from the 2014-2015 American College of Surgeons National Surgical Quality Improvement Program databases. Patients undergoing nonemergent colorectal resection without ostomy creation were grouped based on degree of wound closure: all layers vs deep layers only. Patients left with open abdomens were excluded. Those with wounds or other known infections at the time of surgery were also excluded. Analysis was performed to determine the association between level of wound closure and 30-day outcomes.

Results: A total of 27,577 patients were reviewed; 27,295 had all layers closed, and 282 had deep layers closed only. Compared to patients with all layers closed, those with open skin were younger and more likely to smoke, to be on steroids at the time of surgery, and to have a higher ASA class. They also had a higher body mass index, lower prealbumin, higher WBC, lower HCT, and longer LOS. As expected, those with open skin had a lower rate of superficial SSI (4.72% vs 1.06%, $P=0.0038$), but there were no significant differences between rates of deep SSI, organ-space infection, dehiscence, or anastomotic leak.

Conclusion: Unsurprisingly, leaving a patient's skin incision open after colectomy results in lower rates of superficial SSI. Unlike in trauma patients, however, partial wound closure does not result in lower rates of wound dehiscence, deep SSI, or organ-space infection. The morbidity of an open wound may outweigh any benefit. Based on these results, we cannot recommend leaving the skin open except in the highest risk patients.

61 Incidence of Venous Thromboembolism in Rectal Cancer Surgical Patients Following Neoadjuvant Radiation

Aaron Klinger, MD[1], David Beck, MD[1,2], Heather Green, MS[1], Terrell Hicks, MD[1,2], Brian Kann, MD[1,2], H. David Vargas, MD[1], Charles Whitlow, MD[1,2], David Margolin, MD[1,2]

[1]Department of Colon and Rectal Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Venous thromboembolism (VTE), comprised of deep venous thrombosis (DVT) and pulmonary embolism (PE), is a serious complication and is common in hospitalized patients. Cancer and recent surgery have been shown to be risk factors for VTE. Chemotherapy has been shown to increase the risk of VTE in surgical patients, and radiation therapy has been shown to increase risk of PE in esophagectomy patients. No association has been made between neoadjuvant radiation for rectal cancer and postoperative VTE, however.

Methods: Patients undergoing elective rectal resection included in the 2005-2012 databases from the American College of Surgeons National Surgical Quality Improvement Program were analyzed. These patients were placed into 2 groups: neoadjuvant radiotherapy within 90 days prior to surgery and no radiation. Multivariate regression analysis was performed to determine the association between radiation status and 30-day VTE outcomes. Patients undergoing emergent operation requiring preoperative ventilation ASA class 5 or with preoperative sepsis were excluded. Patients with known bleeding disorders or those taking anticoagulants were excluded as well.

Results: A total of 10,669 patients were included in this study; 942 patients received preoperative radiotherapy, and 9,727 did not receive radiation. Compared to those who did not undergo radiation treatment, patients receiving neoadjuvant radiotherapy were more likely to develop PE (1.17% vs 0.46%, $P=0.0042$). There was no significant difference in rates of DVT, however (0.96% vs 0.96%, $P=0.9983$).

Conclusion: Rectal surgery following neoadjuvant radiotherapy is associated with an increased risk of PE but not of DVT. This is consistent with data published on esophagectomy patients receiving radiotherapy. Guidelines from various organizations recommend the use of chemical VTE prophylaxis for up to 4 weeks following major cancer surgery, but compliance is not universal. Strong consideration to extended prophylaxis should be given to rectal cancer patients, especially those who received radiotherapy.

62 Comparing Central Venous Catheter Use and Mortality for Severe Sepsis and Septic Shock in Physician-Directed and Protocol-Guided Emergency Department Settings

Robert Deveny, BA[1], Jessica A. Ryder, BS[1], Julian M. Williams, MBBS[2], Chelsea A. Dymond, MBBS[1], Richard Tsen, MBBS[1], Jeffery Baker, MD[3], Leonardo Seoane, MD[1,4]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Department of Emergency Medicine, Queensland Health, Brisbane, Queensland, Australia [3]Department of Emergency Medicine, Ochsner Clinic Foundation, New Orleans, LA [4]Department of Pulmonary/Critical Care, Ochsner Clinic Foundation, New Orleans, LA

Background: We compared rates of central venous catheter (CVC) use in patients with severe sepsis (SS) and septic shock (SH) across health systems to determine if its use in the emergency department (ED) managed by a protocol was associated with lower in-house mortality when compared with a physician-directed care environment.

Methods: We performed a retrospective analysis of 2 prospective databases of patients admitted from the ED to the intensive care unit (ICU) for SS and SH between 2007 and 2011. The first cohort was a subanalysis of 250 patients admitted to the ICU with SS and SH in Brisbane, Australia (AU). The second was 422 patients admitted to the Ochsner ICU with SS and SH (US). The US cohort used a protocol based on the Surviving Sepsis Campaign, which included CVC placement. Patients were placed into subgroups based on *Acute Physiology and Chronic Health Evaluation (*APACHE) score and compared for in-hospital mortality and ED placement of CVC.

Results: The AU cohort was, on average, 7.5 years younger (median 56.5, Q1-Q3 40-68) than the US cohort (median 64, Q1-Q3 52-78). The AU cohort had a lower median APACHE score (AU-19, IQR 10 vs US-24, IQR 11, $P<0.001$). There was significantly higher use of CVCs in the US cohort for all APACHE subgroups than in the physician-guided AU cohort ([410/422] 97.16% US vs [96/250] 38.4% AU, $P<0.001$]. The US cohort had higher in-hospital mortality for APACHE scores <10 (US 6/8 vs AU 0/26, $P<0.001$) and 15-19 (US 15% vs AU 3%, $P=0.02$). Mortality for all other APACHE groups was not significantly different ($P>0.05$).

Conclusion: Protocol-driven care led to significantly increased use of CVCs in patients with SS or SH admitted in the ED. CVC use was not associated with improved in-hospital mortality. Although physician-directed care led to less CVC use, further studies are needed to delineate which patients may benefit from CVC use.

63 Time to Antibiotics in Severe Sepsis and Septic Shock: Is There Time for Equipoise?

Jessica A. Ryder, BS[1], Robert Deveny, BA[1], Chelsea A. Dymond, MBBS[1], Richard Tsen, MBBS[1], Julian M. Williams, MBBS[2], Jeffery Baker, MD[3], Leonardo Seoane, MD[1,4]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Department of Emergency Medicine, Queensland Health, Brisbane, Queensland, Australia [3]Department of Emergency Medicine, Ochsner Clinic Foundation, New Orleans, LA [4]Department of Pulmonary/Critical Care, Ochsner Clinic Foundation, New Orleans, LA

Background: The Surviving Sepsis Campaign Guidelines recommend early use of empiric antibiotics for septic shock (SH) and severe sepsis (SS). This has prompted increased use of broad-spectrum antibiotics in the emergency department (ED). We investigated the effect of quality improvement (QI) measures on time to antibiotic administration (AB) and inpatient mortality by comparing a cohort with protocol-driven care to one with standard physician care.

Methods: We performed a retrospective analysis of 2 prospective databases of patients admitted from the ED to the intensive care unit (ICU) for SS and SH from October 2007 to December 2008 and June 2009 to May 2011. The Australian cohort (AU) was a subanalysis of 250 patients from a tertiary referral hospital in Brisbane, Australia, with treatment based on standard physician care. The US cohort (US) was a subanalysis of 422 patients from an academic tertiary referral hospital in New Orleans, LA. US treatment was based on bundled order sets as part of a QI measure, including AB within 2 hours. Subgroups based on *Acute Physiology and Chronic Health Evaluation (*APACHE) score were analyzed to compare AB and in-hospital morality.

Results: The median APACHE score for the US cohort was 24 (IQR 11), while for the AU cohort it was 19 (IQR 10, $P<0.001$). The US had higher rates of AB within 2 hours for APACHE scores of 15-19, 20-24, and 25-29 (Table). The US had higher in-hospital mortality for APACHE scores <10 and 15-19. Multivariate analysis revealed that early AB did not have a significant effect on inpatient mortality for either cohort.

Conclusion: Protocols and QI principles used to treat SS and SH led to higher numbers of patients receiving early antibiotics, which did not improve in-hospital mortality. Our findings support a more thoughtful approach to antibiotic administration in the ED.

Table. Comparison of Antibiotics Within 2 Hours and In-Hospital Mortality

	Antibiotics Within 2 Hours			In-Hospital Mortality		
APACHE Scores	US	AU	P Value	US	AU	P Value
<10	6/8 (75%)	11/26 (42%)	0.225	6/8 (75%)	0/26 (0%)	<0.001
10-14	10/22 (45%)	10/39 (26%)	0.194	3/22 (14%)	1/39 (3%)	0.129
15-19	66/85 (78%)	24/61 (39%)	<0.001	13/85 (15%)	2/61 (3%)	0.025
20-24	86/110 (78%)	29/58 (50%)	<0.001	19/110 (17%)	6/58 (10%)	0.331
25-29	85/95 (89%)	19/34 (56%)	<0.001	29/95 (31%)	10/34 (29%)	1.000
30-34	44/47 (94%)	12/15 (80%)	0.146	18/47 (38%)	2/15 (13%)	0.112
>34	50/55 (91%)	13/17 (76%)	0.249	28/55 (51%)	4/17 (24%)	0.055

64 Assessment of the Factors That May Contribute to Readmission During Healthcare Transitions

Nicolette Reese,[1] Mhy-Lanie Adduru,[1] Sarah Smith,[1] Annadita Kumar,[1] Alexandra Birch,[1] Anthony J. Bell, MBBS[2]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Department of Emergency Medicine, Royal Brisbane and Women's Hospital, Herston, Queensland, Australia

Background: The quality of transitional care from hospital to community is correlated with health outcomes such as hospital readmission and high costs. The Care Transition Measure (CTM) is a verified measure to test the quality of care during transitions from hospital to community from the patients' perspective. To assess how pain, fatigue, and total time spent in the emergency department (ED) influence patients' perceived ease of the overall transition experience between hospital and community care, we conducted a prospective, qualitative study in a major metropolitan teaching hospital ED in Australia.

Methods: One hundred sixteen participants were interviewed 3-5 days after discharge from the ED and responded to the CTM-15 questionnaire and novel questions assessing pain and fatigue at the time of discharge, as well as care transition quality processes (scheduled follow-up visits with a healthcare provider). Total time spent in the ED was obtained through chart review. Correlations were assessed using ANOVA.

Results: Of the 116 participants enrolled, approximately 45% demonstrated pain, and 65% reported fatigue upon leaving the hospital. The mean time spent in the ED was approximately 24 hours, and the mean CTM-15 score was 66 of 100. Overall transition experience was negatively associated with pain (P=0.077) and fatigue (P=0.748). No correlation was found between fatigue and total time spent in the ED. Eighty-four percent of subjects reported having a primary care provider.

Conclusion: CTM-15 scoring demonstrated a high quality of care transition from hospital to community but did not correlate with reported levels of pain, fatigue, or total admission time. Further studies are needed to better identify the factors that put patients at risk for readmission.

65 Comparison of the Utilization of First-Generation Fiber-Optic vs Second-Generation Digital Single-Operator Peroral Cholangioscopy

Ebubekir S. Daglilar, MD, Ricardo Romero, MD, Luke McCrone, MD, Janak Shah, MD, Abdul El Chafic, MD

Department of Gastroenterology, Ochsner Clinic Foundation, New Orleans, LA

66 Impact of Needle-Based Confocal Endomicroscopy in Diagnosis of Pancreatic Cystic Neoplasms

Farnaz Shariati, MD[1], Elizabeth D. Verter, BA[2], Maya Lucas, MS[2], Virendra Joshi, MD[2,3]

[1]Department of Internal Medicine, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [3]Department of Gastroenterology, Ochsner Clinic Foundation, New Orleans, LA

Background: Endoscopic ultrasound (EUS) has been found to be an effective tool in diagnosing pancreatic cystic neoplasm (PCN). Carcinoembryonic antigen (CEA) tumor marker has also been used to differentiate PCN and is the most accurate marker of mucinous cystic neoplasms. Recently, needle-based confocal laser endomicroscopy (nCLE) has been increasingly used for the diagnosis of PCN. nCLE allows for evaluation of pancreatic cysts with results similar to that of a pathologic diagnosis. In this study, we compared our standard of care, EUS, with combined CEA and nCLE to determine which combination of diagnostic modalities is a better predictor of PCN.

Methods: In this retrospective chart review, 22 patients with pancreatic cysts were evaluated. Specificity and negative predictive value (NPV) of EUS alone or EUS with CEA and nCLE combined were evaluated, and diagnostic accuracy was compared with pathology using the McNemar test. In evaluation of data knitter, caret and cluster methods were used. Worrisome features (increased cyst size, wall thickness, main pancreatic duct size, the presence of nonenhanced mural nodules, abrupt changes, distal atrophy, and lymphadenopathy) were tested by determining dissimilar calculations using Euclidean distance and later were used in hierarchical clustering to create 2 clusters based on Euclidean distance.

Results: Diagnosis of PCN using EUS alone had a specificity of 0.75 and an NPV of 0.88. EUS and CEA combined had a specificity of 0.95 and an NPV of 0.90. Finally, EUS with CEA and nCLE combined had a specificity of 0.80 and an NPV of 0.94. Worrisome features clustering was able to predict pathology (P=0.000289).

Conclusion: We concluded that specificity and NPV of EUS predicting PCN are positively impacted by the addition of CEA and nCLE. We also found that clustering of worrisome factors predicts pathology; however, a larger cohort is required for future studies.

67 Characteristics of Patients Undergoing Fecal Microbiota Transplantation for *Clostridium difficile* Infection: One Institution's Story

Jacob Breaux, MD[1], Arnab Ray, MD[1], Sherif Michael, MD[2]

[1]*Department of Gastroenterology, Ochsner Clinic Foundation, New Orleans, LA* [2]*Department of Internal Medicine, Ochsner Clinic Foundation, New Orleans, LA*

Background: *Clostridium difficile* infection (CDI) accounts for 20%-30% of antibiotic-associated diarrhea cases and is the most commonly recognized cause of infectious diarrhea in healthcare settings. Based on experience, fecal microbiota transplantation (FMT) represents an effective therapeutic option for the treatment of recurrent CDI, with worldwide cure rates as high as 93%. Our hope is that one institution's experience can elucidate pertinent characteristics in our FMT population.

Methods: We performed a retrospective chart review of selected patient data on 106 patients who received FMT at Ochsner from August 2012 to February 2016.

Results: FMT was performed in 106 patients. The 83 females and 23 males ranged in age from 17-94 years (mean, 61 years), with 93 Caucasians, 10 African Americans, 2 Hispanics, and 1 Asian. One hundred patients had FMT done for recurrent CDI, and 6 patients had severe/complicated CDI, with African Americans accounting for 2 patients. After 3.5 years, we have repeated FMT in 4 patients. Forty patients had prior cholecystectomy, 75 had antibiotic use prior to their first CDI episode, and 49 were on PPIs or H2 blockers. Of the 21 patients considered immunosuppressed, 12 were on corticosteroids and 6 were organ transplant recipients. The average distance traveled to receive FMT was 90 miles (range, 3-463 miles).

Conclusion: Based on our experience, Caucasians, older adults, and women had a higher incidence of recurrent CDI, and African Americans had a higher proportion of severe/complicated CDI with a greater percentage of risk factors. The small number of patients requiring repeat FMT each had several risk factors. Similar to other studies, we noted a high rate of antibiotic use and acid suppression therapy. Of interest, we report a significantly elevated cholecystectomy rate compared to national data. Finally, given the success of FMT and the significant travel burden noted, increased access is essential.

68 Impact of Endotracheal Intubation on Endoscopic Retrograde Cholangiopancreatography Unit Efficiency

Luke McCrone, MD, Abdul El Chafic, MD, Ebubekir S. Daglilar, MD, Ricardo Romero, MD, Janak Shah, MD

Department of Gastroenterology, Ochsner Clinic Foundation, New Orleans, LA

Background: Endoscopic retrograde cholangiopancreatography (ERCP) is a technically complex procedure that is usually performed under a deep level of sedation with anesthesia support. Deep sedation needed to facilitate ERCP can be achieved with or without endotracheal intubation. The impact of endotracheal intubation on ERCP unit efficiency is not well studied.

Methods: We retrospectively analyzed 100 consecutive ERCPs performed at our center and recorded the following characteristics in intubated and nonintubated cohorts: patient demographics, body mass index, American Society of Anesthesiologists score, inpatient/outpatient status, and ERCP difficulty grade (1-4 per modified Schutz scale). The following ERCP unit efficiency metrics were collected: preprocedural room time (interval from patient entering procedure room to endoscope insertion), total ERCP procedure time (endoscope insertion to endoscope withdrawal), postprocedural room time (interval from endoscope withdrawal to procedure room exit), total time in procedure room (interval from entering to leaving the procedure room), and postanesthesia recovery time. Data from the intubated and nonintubated cohorts were compared using Fisher exact test and *t* test, as appropriate. Patients undergoing combined ERCP and other endoscopic procedures (eg, endoscopic ultrasound, duodenal stent placement) were not included in either cohort.

Results: There were no differences in patient characteristics, procedural complexity, or cardiopulmonary adverse events in the intubated (n=57) and nonintubated (n=43) ERCP patients. Compared to nonintubated patients, intubated patients had a longer mean preprocedural room time (21.2 ± 6.7 vs 15.8 ± 5.9 minutes, $P=0.0001$), postprocedural room time (13.1 ± 5.5 vs 8.5 ± 3.7 minutes, $P<0.0001$), total time in the procedure room (66.6 ± 25.8 vs 49.8 ± 18.9 minutes, $P=0.0005$), and postanesthesia recovery time (78.5 ± 48.4 vs 48.8 ± 34.2 minutes, $P=0.0009$). ERCP procedure times were similar in both groups.

Conclusion: Endotracheal intubation significantly increases patient time in the ERCP procedure room and postanesthesia recovery area. The need for endotracheal intubation should be carefully considered with respect to ERCP unit efficiency.

69 Assessment of ASGE/ACG Quality Indicators in Esophagogastroduodenoscopies Performed at a Tertiary Care Hospital

Rashid Z. Syed, MBBS[1], Jacob Breaux, MD[1], Muhammad F. Mubarak, MBBS[2], Wilson E. Kyle, Usman Rahim, MD[2], Sean E. Connolly, MD[1]

[1]Department of Gastroenterology, Ochsner Clinic Foundation, New Orleans, LA [2]Department of Internal Medicine, Ochsner Clinic Foundation, New Orleans, LA

Background: In 2015, the American Society for Gastrointestinal Endoscopy (ASGE) and the American College of Gastroenterology (ACG) published guidelines that included quality indicators (QIs) that can be measured to assess the quality of esophagogastroduodenoscopy (EGD) procedures. Our aim was to determine if the quality of EGDs performed at our hospital was within the performance target of 98% set by ASGE/ACG.

Methods: We retrospectively reviewed all EGDs performed on adult patients at our hospital in June 2015. Descriptive analysis was performed to determine if these EGDs met the 98% performance target for the 18 selected preprocedure, intraprocedure, and postprocedure ASGE/ACG QIs.

Results: Four hundred eighty-five EGDs were performed. Of these EGDs, 66.2% were outpatient, 29.9% were inpatient, and 3.9% were performed in the intensive care units. Average patient age was 60.0 years (range, 18.8-97.4 years). Average procedure duration was 8 minutes and 39 seconds (range, 1-107 minutes). Frequency with which gastroenterologists appropriately performed and documented each of the selected 18 EGD QIs is detailed in the Table. The frequency with which our gastroenterologists performed and documented most of the preprocedure and postprocedure QIs was $>$90% but failed to reach the 98% performance target. The frequency with which our EGD reports documented postprocedure QIs was well below the 98% performance target.

Conclusion: Effectiveness of an EGD as a diagnostic and therapeutic modality for disorders of the esophagus, stomach, and duodenum is contingent on quality. Quality of EGD examinations at our center for the 18 selected ASGE/ACG QIs remains below the performance target of 98%. This is attributable to several factors, including variation between practices of individual gastroenterologists, poor documentation of services stated rendered, and poor documentation of postprocedural recommendations.

Table. Frequency With Which Preprocedure, Intraprocedure, and Postprocedure Quality Indicators Were Appropriately Performed and Documented

	Quality Indicator Is Appropriately Performed and Documented	Number of EGDs Reviewed
Preprocedure Quality Indicator		
Appropriate prophylactic antibiotics are given before EGD in patients with cirrhosis with acute upper GI bleed	91.7%	12
Appropriate prophylactic antibiotic are given and documented before placement of a PEG tube	54.5%	11
Intravenous proton pump inhibitor are given before EGD for suspected peptic ulcer bleeding	92.3%	52
Vasoactive drugs are initiated before EGD for suspected variceal bleeding	90.9%	11
Intraprocedure Quality Indicator		
Esophageal findings are documented	97.7%	485
Esophageal findings are photographed	88.0%	485
Stomach findings are documented	97.3%	483
Stomach findings are photographed	93.6%	483
Duodenal findings are documented	96.4%	472
Duodenal findings are photographed	94.1%	472
Retroflexion in the stomach is documented	36.4%	478
Retroflexion in the stomach is photographed	74.7%	478
Appropriate description of peptic ulcers	97.4%	38
Endoscopic therapy is performed for ulcers with active bleeding or visible vessel	100%	4
Epinephrine injection is followed by clipping or thermal therapy for ulcers with active bleeding or visible vessel	100%	3
Postprocedure Quality Indicator		
Proton pump inhibitors are recommended after dilation of esophageal stricture	57.6%	33
Proton pump inhibitors are recommended after gastric or duodenal ulcer diagnosis	68.8%	48
Testing planned or performed for Helicobactor pylori infection when ulcers are documented	69.0%	58

70 Liver Disease Management TeleECHO Improves Provider Knowledge and Care of Patients With Liver Diseases

Shobha Joshi, MD[1], Chrisey Smith, BS, BA[2], John Seal, MD[2,3], David Kirsch, MD[3,4], Trevor Reichman, MD[3,5], Natalie Bzowej, MD[1], Inna Goldvarg, NP[6], George Therapondos, MD[1,2,3], Reinaldo Rampolla, MD[7], Nigel Girgrah, MD[1]

[1]Department of Gastroenterology and Hepatology, Ochsner Clinic Foundation, New Orleans, LA [2]Multi-Organ Transplant Institute, Ochsner Clinic Foundation, New Orleans, LA [3]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [4]Department of Radiology, Ochsner Clinic Foundation, New Orleans, LA [5]Abdominal Transplant, University of Virginia Commonwealth, [6]Department of Gastroenterology, Loma Linda University, Loma Linda, CA [7]Department of Pulmonary/Critical Care, Ochsner Clinic Foundation, New Orleans, LA

Background: TeleECHO is a video conference designed to teach, learn, guide, and interact with healthcare providers and to bridge knowledge gaps between specialists at academic health centers and healthcare providers in remote areas. Thus, specialized healthcare is delivered to patients in nonspecialized primary care clinics. Liver disease management TeleECHO began in March 2014 at Ochsner Health System (OHS) with 5-10 participants from outside clinics.

Methods: Hepatologists, transplant surgeons, and interventional radiologists at OHS made short presentations at monthly conferences, followed by a discussion. Participants presented cases using HIPAA-compliant methods. A questionnaire was sent at the end of 3 years to all participants, and they rated the TeleECHO on a 0-3 scale (0=none, 1=low, 2=medium, 3=high) to evaluate the provider's perception of the benefits in knowledge acquired, patient care improvement, continuing medical education certification, and overall satisfaction. The topics were categorized as hepatitis B and C, general hepatology, and transplant hepatology.

Results: Thirty participants attended the TeleECHO conference, with consistent attendance from 8. Twenty participants completed the survey. Overall satisfaction and access to TeleECHO staff were rated highest in all categories. The median gain in knowledge and the ability of participants to manage their patients with liver disease increased by 1 point in each category. Participant interest was highest in hepatitis B and C, medium in transplant hepatology, and lowest in general hepatology. Continuing education credits were well received by most participants. They rated at 2.6 their interest in teaching other healthcare providers and trainees. All participants would highly recommend attending TeleECHO to others.

Conclusion: TeleECHO is a highly effective tool to deliver specialty care to patients with liver disease by teaching primary healthcare providers state-of-the-art methods under the guidance of specialty providers. TeleECHO can be used for any therapeutic area and vastly expands the pool of providers to deliver patient care.

71 Chemotherapy-Induced Peripheral Neuropathy in Breast Cancer Patients who Received Taxane-Based Chemotherapy: A Single-Institution Experience

Ryan Griffin, MD[1,2], Behram Khan, MBBS[2], Do Young Kim, MBBS[2], Cynthia Yeh, MBBS[2], John Cole, MD[1,2]

[1]Department of Hematology/Oncology, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Chemotherapy-induced peripheral neuropathy is a significant cause of morbidity, both during treatment and after completion of chemotherapy. The incidence of chemotherapy-induced peripheral neuropathy in patients receiving neurotoxic chemotherapy agents is approximately 30%-40%. Taxanes, including docetaxel and paclitaxel, are widely used in the treatment of breast cancer and frequently cause peripheral neuropathy in this patient population.

Methods: In this retrospective study of patients with breast cancer who received either docetaxel or paclitaxel, we compared incidence rates of chemotherapy-induced peripheral neuropathy based on multiple factors, including age at diagnosis, race, and preexisting neuropathy. We also studied the clinical course of neuropathy, whether specific treatments were given, and whether there was improvement in symptoms.

Results: One hundred fifty-seven patients were identified between January 2013 and October 2015. Of these 157 patients, 82 patients (52.2%) were diagnosed with chemotherapy-induced peripheral neuropathy (grade 2 or higher) at some point during their treatment with docetaxel or paclitaxel. The average age of patients diagnosed with chemotherapy-induced peripheral neuropathy was 55.23 years. This group included 43 Caucasian patients and 26 African American patients, representing 50% of all Caucasian patients and 59.1% of all African-American patients, respectively. Eighteen patients had preexisting neuropathy, the majority of whom were non-Caucasian patients (67%). Fifty percent of patients diagnosed with chemotherapy-induced peripheral neuropathy were offered treatment. Improvement in symptoms was documented in 43.9% of patients.

Conclusion: Our analysis shows that the incidence of chemotherapy-induced peripheral neuropathy in patients with breast cancer who receive taxane-based chemotherapy is high and affects African Americans at a higher rate than Caucasians. Chemotherapy-induced peripheral neuropathy remains a significant cause of morbidity for breast cancer patients, both during treatment and after completion of chemotherapy. At-risk populations include African Americans and patients with preexisting neuropathy.

72 Augmenting Accurate Diagnosis and Successive Treatment of Opioid Misuse in the Clinical Encounter: Measuring Outcomes

Jasmine Bahd[1], Marianne Maumus, MD[1,2], John Jeffreys, MA[3]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Department of Hospital Medicine, Ochsner Clinic Foundation, New Orleans, LA [3]Medical Informatics, Ochsner Clinic Foundation, New Orleans, LA

Background: The increase in the number of opioid prescriptions written in the past 2 decades in attempts to relieve chronic pain has been associated with higher utilization of healthcare services by chronic pain patients receiving opioid analgesia and mirrored by a parallel increase in prescribed opioid misuse. Nevertheless, detection of opioid misuse remains a recognized challenge for physicians.

Methods: We implemented a standardized, comprehensive opioid use assessment note, which integrates documentation of literature-cited factors potentially efficacious in opioid misuse screening in patient electronic medical records (EMRs), during admission to facilitate diagnosis of opioid misuse and successive individualized management to reduce future clinical encounters and associated costs.

Results: Outcomes measured for a 41-patient cohort were compared 6 months prior to the clinical encounter integrating the note and 6 months after. The number of admissions, days, and average length of stay decreased by 17%, 36%, and 13%, respectively, whereas emergency department admissions increased by 15%. Outpatient total direct costs increased by 13%; however, inpatient total direct costs, total direct costs, and inpatient total direct costs per admission decreased by 44%, 35%, and 27%, respectively.

Conclusion: Appropriate diagnosis of opioid misuse allowing proper patient management is pivotal in addressing issues resulting from the opioid epidemic including associated increases in unintentional overdose and death along with higher rates of healthcare utilization and associated costs. Implementing and normalizing usage of a standardized opioid note in patient EMRs that accounts for the complexity of chronic pain patients may help facilitate physician diagnosis and address cultural barriers preventing opioid misuse recognition.

73 Risk Factors Associated With Vancomycin-Resistant Enterococci Infections in Hospitalized Patients

Alessandro Iliceto, BLA[1], Katherine Baumgarten, MD[2], Dana Schmucker, MSPH[2], Dawn Burke, PhD[2], Julia Garcia-Diaz, MD[1,2]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Department of Infectious Diseases, Ochsner Clinic Foundation, New Orleans, LA

Background: Vancomycin-resistant enterococci (VRE) infections have a significant impact in hospital facilities, particularly in tertiary health systems where patients present with multiple comorbidities and require extended hospital stays. The aim of this study was to evaluate potential risk factors attributable to VRE infections in the Ochsner Health System and assess whether infections had a significant role in patient morbidity and mortality. Evaluation of transmission is in progress.

Methods: Microbiological records from July 2015 through February 2016 were reviewed for all *Enterococcus faecalis* and *Enterococcus faecium* cultures. Isolates from all sources, along with susceptibility testing, were included. Data collection was extracted from the medical records and included comorbidities, antibiotic exposure prior to infection, intensive care unit stay, and procedures in the prior year. Mortality at 30 and 90 days after the onset of the culture was also evaluated.

Results: One hundred seventy patients were identified with positive VRE cultures. Urine was the most common source (n=106). Prior antibiotic exposure showed the highest correlation, with the majority of patients having received multiple courses of treatment. Ventilator support had the highest prevalence (50.9%) of all the risk factors analyzed. Mortality at 30 days was 13.8% and at 90 days was 16.3%.

Conclusion: VRE infections are a major public health concern due to many risk factors including the overuse of certain antimicrobials. Our study shows that extensive antibiotic therapy and ventilation use remain determining factors associated with VRE infections. VRE transmission has been well documented in the literature, and this study's second objective was to determine if transmission was occurring among patients; characterization of the VRE isolates is ongoing. Our study reinforces the importance of antimicrobial stewardship programs in tertiary health systems and thorough infection control to limit the spread of the pathogen. Basic source prevention measures may considerably decrease VRE infection rates among hospitalized patients.

74 Ocular Candidiasis in Patients With Candidemia at a Large Tertiary Care Center

Bonny Lee, MD[1], Lydia Breskin, MS[2], Laya Reddy, MBBS[3], Alessandro Iliceto, BLA[3], Deborah Ashcraft, BS[4], George Pankey, MD[3,4], Jonathan D. Nussdorf, MD[3,5], Julia Garcia-Diaz, MD[3,6]

[1]Department of Internal Medicine, Ochsner Clinic Foundation, New Orleans, LA [2]Tulane University School of Medicine, New Orleans, LA [3]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [4]Laboratory of Infectious Disease Translational Research, Ochsner Clinic Foundation, New Orleans, LA [5]Department of Ophthalmology, Ochsner Clinic Foundation, New Orleans, LA [6]Department of Infectious Diseases, Ochsner Clinic Foundation, New Orleans, LA

Background: Bloodstream infections (BSI) caused by *Candida* sp have a high mortality rate and have been increasing in recent years. Ocular candidiasis (OC) is one systemic manifestation of *Candida* infection, either chorioretinitis or endophthalmitis, and may lead to vision loss. Therefore, the Infectious Diseases Society of America recommends an ophthalmology examination for all patients with *Candida* BSI. However, the reported incidence of OC varies from 1%-25%, questioning routine eye examinations in these patients. The purpose of this study was to evaluate the number of patients who undergo ophthalmologic examinations and those diagnosed with OC at Ochsner Medical Center, New Orleans, LA.

Methods: One hundred forty-four patients were identified from January 2013 to December 2015 with at least one positive blood culture for *Candida* sp *(*only *albicans*, *glabrata*, and *parapsilosis* were included). Records were reviewed through the Epic system.

Results: Of the 144 patients, 65 were females and 79 were males; the average age was 58 years. Seventy-six (52.8%) patients had an ophthalmologic examination at Ochsner excluding 1 patient who refused an examination, 1 patient who was excessively combative, and 1 patient in whom examination was deferred due to medical condition. Three patients (3.9%) showed *Candida* chorioretinitis, and none showed endophthalmitis.

Conclusion: OC can have devastating consequences if left untreated, and early diagnosis is imperative. Our analysis revealed that OC was present in 3.9% of ophthalmology examinations, but this finding may be biased toward patients who are cooperative and can tolerate a dilated eye examination. Critical patients with multiple comorbidities may be at higher risk for OC. A weakness of our study is that it is limited to ophthalmology records at Ochsner, and there may be records at outside facilities. Further data are required to make recommendations in patients with *Candida* BSI.

75 The Obesity-Sepsis Paradox

Brittany M. McKinley, BS[1], Waseem Gazale, MBBS[2], Julia Garcia-Diaz, MD[1,2]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Department of Infectious Diseases, Ochsner Clinic Foundation, New Orleans, LA

Background: Sepsis continues to be a significant cause of morbidity and mortality in patients. A recent look at obesity in the setting of sepsis has presented conflicting conclusions. While early studies showed that obesity negatively impacts patient outcomes, more recent studies show improved outcomes in the obese subgroups. This has become known as the obesity paradox.

Methods: This study was an observational retrospective cohort study of 261 patients obtained from a larger data set who were admitted to Ochsner Medical Center in 2013 with severe sepsis/septic shock. Patients were weighed on admission and grouped in 4 subcohorts based on body mass index (BMI), ranging from underweight (BMI $<$18.5 kg/m^2) to morbidly obese (BMI $\geq$40 kg/m^2). Inclusion criteria were age $\geq$18 years and presumed severe sepsis/septic shock. Exclusion criteria were age $<$18 years or pregnancy. Morbidity was defined as discharge to a facility other than home/home health.

Results: Results are presented in the Table.

Conclusion: A definitive correlation between obesity and outcomes remains elusive. It has been proposed that patients with higher BMIs are at a lower risk of being overresuscitated and have extra nutritional reserves, which could explain apparent improved outcomes. A deeper look with further isolation of variables is essential to shed light on the obesity paradox and perhaps bring about a more clinically relevant assessment of this relationship.

Table. Patient Outcomes by Body Mass Index (BMI) Subgroup

Outcome	BMI $<$18.5 kg/m^2 n=16	BMI 18.5-29.9 kg/m^2 n=153	BMI 30-39.9 kg/m^2 n=65	BMI $>$40 kg/m^2 n=27
Mortality	31.3%	30.1%	27.69%	29.63%
Morbidity	37.5%	35.3%	33.85%	22.22%
Hospice	83.3%	27.8%	9.2%	16.7%
Other	16.7%	72.2%	90.8%	83.3%

76 15 Seconds to Save a Life: Increasing Hand Hygiene Adherence

Jennilee St. John, MSN[1], Katherine Baumgarten, MD[1], Dana Schmucker, MSPH[1], Kramer Austin, MS[2]

[1]Department of Infection Control, Ochsner Clinic Foundation, New Orleans, LA [2]Project Management Office, Ochsner Clinic Foundation, New Orleans, LA

Background: The prevention of healthcare-acquired infections (HAIs) is a national quality initiative to promote patient safety. Healthcare facilities are challenged to implement evidence-based practices to eliminate HAIs, and an intervention that is common to all HAI prevention plans is hand hygiene. Strong evidence supports that hand hygiene adherence rates ($\geq$90%) can improve HAI rates.

Methods: Collection of hand hygiene adherence was standardized utilizing trained secret shoppers who directly observed hand hygiene practice throughout the hospital. Additional secret shoppers were recruited to increase the sample size. A slogan "15 Seconds to Save a Life" and catchphrase "Take 15" were rolled out in July 2016, and signage was placed throughout the hospital. An online module was assigned to all employees, and leaders emphasized to their staff the importance of teamwork in reminding others to "Take 15" when a missed opportunity for hand hygiene was witnessed.

Results: In 2016, hand hygiene adherence increased from 61% to 84%. The number of active secret shoppers also increased from 13 to 69. The number of observations has more than doubled from an average of 1,000/month to 2,500/month, with increasingly diverse secret shoppers from various departments (Jan-9, Dec-33) and healthcare worker types (Jan-2, Dec-15). There has also been a cultural shift toward shared accountability for hand hygiene adherence, and staff report increased comfort using the "Take 15" catchphrase to remind others to perform hand hygiene.

Conclusion: Continued improvement in hand hygiene adherence is dependent on continuing to develop a culture of safety. Future efforts to support this include recruiting additional secret shoppers and engaging leaders, focusing on low-performing areas, increasing staff physician involvement in the campaign, and celebrating those with high performance or great improvement.

77 Human Immunodeficiency Virus Prophylaxis in the Ochsner Healthcare System

Mae Lindner, BS[1], Ioni Kokodis, BS[1], G. Dodd Denton, MD[1,2]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Department of Internal Medicine, Ochsner Clinic Foundation, New Orleans, LA

Background: In 2014, Louisiana had the highest incidence rate of human immunodeficiency virus (HIV) among US states, primarily in men who sleep with men. Preexposure prophylaxis (PrEP) for HIV with once daily oral emtricitabine/tenofovir disoproxil fumarate can reduce the risk of HIV transmission by more than 90%. A close examination of Ochsner Health System's experience with PrEP can be used to improve practice and inform quality improvement activities.

Methods: We performed a retrospective cohort study to evaluate care of patients receiving PrEP at Ochsner facilities between July 2014 and August 2016. We extracted data on demographics, blood work, and sexually transmitted infection (STI) testing.

Results: Among this cohort of 126 patients, 95.2% were male, 78.6% were Caucasian, and 17.5% were African American. HIV testing was performed regularly (mean of 145 days, median of 104 days). There were no positive HIV tests during the study; however, other STIs were diagnosed. Sixteen patients (12%) had at least one positive serologic test for syphilis; 9 (7%) had at least one positive test for gonorrhea; and 14 (11%) had at least one positive test for chlamydia.

Conclusion: Only 17.5% of the Ochsner PrEP cohort was African American, even though 31% of Ochsner patients and 68% of patients with new HIV diagnoses in New Orleans in 2015 were African American. Current PrEP guidelines recommend HIV testing every 90 days, but in this cohort, HIV testing was done much less frequently. While no patients were diagnosed with HIV during the study period, patients in the cohort frequently developed other STIs. This is consistent with prior reports. With this information, we identified a need for better outreach to patients at higher risk, improved provider education, and patient education on continuing safe sex practices with PrEP use.

78 What Is the Gold-Standard Model of Care for Pregnant Adolescents?

Shani Truong, BS, MS[1], Mieke van Driel, MD, MSc, PhD[2], Hannah Tang, BS[3], Wendy Brodribb, MBBS, PhD[2], Veronica Gillispie, MD[1,4]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Discipline of General Practice, The University of Queensland School of Medicine, Brisbane, Australia [3]School of Medicine, The University of Queensland School of Medicine, [4]Department of Obstetrics and Gynecology, Ochsner Baptist Hospital, New Orleans, LA

Background: The circumstances of pregnant adolescents are uniquely challenging given that this population has higher rates of unplanned pregnancies and faces a more difficult transition to motherhood. There is growing evidence that adolescent-specific antenatal care improves pregnancy and infant outcomes. Tailored interventions for adolescents can result in lower rates of low birth weight and higher breastfeeding initiation. However, there remains no gold-standard program for pregnant adolescents. This systematic review aimed to (1) examine the literature for perinatal care strategies targeted toward adolescents and (2) identify strategies within new models of care that have demonstrated positive clinical and psychosocial outcomes in mother and child.

Methods: A search of the major health literature databases (PubMed, CINAHL, and Embase) was conducted for papers published between 2000 and 2016. The following search terms were included as MeSH and non-MeSH keywords: "teenagers," "adolescents," "young adult," "pregnant," "antenatal," "prenatal," "postnatal," "interventions," and "programs." The search results were reviewed by 2 independent researchers.

Results: From a systematic search of major health databases, 4,515 citations were identified and reviewed. A total of 2,511 nonduplicated titles and abstracts were assessed, from which 13 randomized controlled trials were identified and included in the study. Eight of the studies were conducted in the United States; 2 were from the United Kingdom; and one each was from Canada, Egypt, and Brazil. The studies were predominantly located in urban settings and had teenagers who came from lower socioeconomic backgrounds. The programs provided prenatal care, parenting knowledge, social support, and support for maternal depression and substance abuse.

Conclusion: Age-specific interventions have been shown to reduce adverse infant outcomes and improve maternal factors. In the development of a model of care to fit the needs of adolescents, it is feasible to use an evidence-based approach when customizing antenatal, perinatal, and postnatal interventions.

79 Achieved Mean Arterial Pressure Increase During Treatment of Hepatorenal Acute Kidney Injury

Anabelen R. De Rosales, MD[1], Juan Carlos Q. Velez, MD[1,2]

[1]Department of Nephrology, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

80 Blood Urea Nitrogen and Rapidity of Correction of Hyponatremia in Syndrome of Inappropriate Antidiuretic Hormone Secretion With Tolvaptan

Manuel Gonzalez, MD[1], Juan Carlos Q. Velez, MD[1,2]

[1]Department of Nephrology, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

81 Comparison of Multiphase Computed Tomography Angiography and Computed Tomography Perfusion for Triage of Acute Ischemic Stroke: A Single Center's Experience

Garrett Bennett, MD[1], Jayson Lavie, MD[1], Abeer Albar, MBBS[1], Kyle Wojcik, BS[2], Stephen Arndt, MD[1], James Milburn, MD[1], Gabriel Vidal, MD[2,3]

[1]Department of Radiology, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [3]Department of Neurology, Ochsner Clinic Foundation, New Orleans, LA

Background: Multiphase computed tomography angiography (MCTA) has recently been advocated as an acceptable alternative to whole brain computed tomography perfusion (CTP) for identifying patients with intracranial large vessel occlusion (LVO) who may benefit from thrombectomy. Our institution recently transitioned from CTP to MCTA for triage of acute stroke patients. The purpose of the study was to determine how this transition has influenced patient selection for thrombectomy and outcomes.

Methods: The imaging database was queried for all patients evaluated for thrombectomy at our comprehensive stroke center from the implementation of MCTA in August 2016 through November 2016. Rates of thrombectomy, TICI scores, and admission and discharge NIHSS for patients who underwent MCTA were compared to our prior database of CTP of thrombectomy candidates from January to December 2015.

Results: Thirty-six of 101 patients who underwent MCTA were found to have anterior LVO (35%), compared to 162 of 401 patients who underwent CTP (40%). The rate of inclusion for thrombectomy of the MCTA cohort with LVO (53%) was significantly higher than the CTP cohort (36%, $P<0.0001$). Successful reperfusion rates ($\geq$TICI 2B) were similar between CTP and MCTA (86% and 79%, respectively). Patients triaged with MCTA had a significantly lower discharge NIHSS than those who underwent CTP (9.6 vs 10.7, $P=0.0002$). There was no statistically significant difference between the initial NIHSS of patients who underwent MCTA vs CTP (18 vs 17, $P=0.55$) or of the improvement in NIHSS from admission to discharge compared to the CTP cohort (8.3 vs 6.7, $P=0.52$).

Conclusion: Using MCTA for triage of patients with acute stroke due to LVO led to more patients being selected for intervention compared to CTP with similar clinical scores for both groups at discharge.

82 Machine Learning Predictive Analysis Could Improve Patient Selection for Mechanical Thrombectomy

Stephen Arndt, MD[1], Daryl T. Goldman, BS[2], Abeer Albar, MBBS[1], Garrett Bennett, MD[1], James Milburn, MD[1]

[1]Department of Radiology, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

83 Implementation of Clinical Practice Guidelines and Education to Reduce Bowel Dysfunction in Multiple Sclerosis Patients

Amber E. Peskin, MN, AGCNS-BC, MSCN

Department of Neurology, Ochsner Clinic Foundation, New Orleans, LA

Background: Bowel dysfunction in multiple sclerosis (MS) is common yet undertreated. The objective of this study was to educate MS patients about interventions to improve bowel function and evaluate outcomes.

Methods: This prospective study evaluated the effect of patient education and implementation of clinical guidelines on bowel function among MS patients using the Bowel Control Scale (BWCS). A convenience sample of adult MS patients in the Ochsner MS center was invited to participate. Sample size estimate was 71 using G*Power 3.1, alpha=0.05, Power=0.80, and $d=0.3$. Requirements were that individuals had an MS diagnosis and reported symptoms of bowel dysfunction. Every subject was given an educational brochure, a bowel diary originally published in proceedings of the 2011 consensus conference on elimination dysfunction in MS, and a counseling session with an MS-certified nurse focusing on behavior, diet, and reflexes to stimulate normal bowel movements. The outcome of improved bowel function was assessed by comparing mean scores on the BWCS before patients received education/counseling by an MS-certified nurse and after 3 months of implementation of education.

Results: At study initiation, the mean score on the BWCS was 6.29. At study termination, the mean score on the BWCS was 5.12, suggesting improvement in bowel function among participants. A Wilcoxon test examined results of the preintervention and postintervention BWCS scores, and a significant difference was found ($Z=-2.879$, $P<0.05$). Improvement in bowel function was seen in 60% of subjects, as evidenced by lower scores on the postintervention BWCS. A higher score was seen in 20% of subjects, suggesting worsening of bowel function; 20% had the same BWCS score before and after the intervention, suggesting no change in bowel function.

Conclusion: Patient education and counseling can lead to significant improvement in bowel function of MS patients.

84 The Feasibility of Measuring Diabetes Distress and Implementing a Toolkit to Improve Outcomes in Adults With Uncontrolled Type 2 Diabetes

Daneeka Woods, DNP, APRN, ANP-C, CDE

Department of Endocrinology, Ochsner Clinic Foundation, New Orleans, LA

Background: Diabetes distress affects as many as 40% of people diagnosed with diabetes. Diabetes distress is associated with reduced glycemic control. Scientific evidence suggests that interventions such as support groups, keeping a journal, and closely monitoring blood glucose can reduce diabetes distress, improve diabetes control, and reduce associated healthcare costs.

Methods: This pilot project recruited participants from a high-volume diabetes specialty clinic. One hundred seventy-five patients interested in participating were screened using the 17-item diabetes distress survey to determine diabetes distress. Those with type 2 diabetes (T2DM), an A1C $\geq$7%, and diabetes distress were invited to participate in the project. Participants received a telephone call 4-6 weeks after the initial visit to discuss their utilization of the interventions. At the 3-month postintervention follow-up visit, both diabetes distress and A1C were measured. Preintervention and postintervention diabetes distress and A1C measures were analyzed.

Results: Eleven patients (mean age, 59.64 years, range 35-80; mean years diabetic, 19.45 years, range 7-50) meeting inclusion criteria were included in data analyses. The mean preintervention A1C was 10.01 $\pm$ 0.97, and the mean postintervention A1C was 9.73 $\pm$ 0.81 for a 12.79% reduction. All 11 participants demonstrated diabetes distress preintervention; however, only 3 reported diabetes distress postintervention. There was no difference in A1C from preintervention to postintervention between patients who did not use the toolkit (n=2, 13.08% decrease) and patients who used $\geq$1 toolkit component (n=3, 13.11% decrease). In patients who used $\geq$2 toolkit components (n=3), there was a 16.70% change in postintervention A1C.

Conclusion: This pilot demonstrated the feasibility of measuring diabetes distress and implementing a toolkit in T2DM. Next steps are to conduct a future study to test if the toolkit interventions are responsible for reducing diabetes distress and improving A1C.

85 Diabetes Distress in Patients With Type 2 Diabetes Hospitalized on Medicine Units

Lori Lemoine, DNP, APRN, FNP-BC, BC-ADM, Karen Rice, DNS, APRN, ACNS-BC, ANP

Department of Endocrinology, Ochsner Clinic Foundation, New Orleans, LA

Background: Diabetes distress refers to the emotional burdens and concerns that diabetes patients face with lifelong self-management and glycemic control. It occurs in 18%-35% of diabetes patients. Recent studies support a correlation between increased diabetes distress and A1C. Therefore, management of diabetes distress should improve glycemic outcomes and minimize the risk of associated morbidity and mortality in this high-risk population. The purpose of this study was to assess diabetes distress and patient characteristics in inpatients to identify opportunities for developing a postdischarge diabetes distress program for type 2 diabetes patients.

Methods: Three medicine units at one hospital were used to enroll 220 adult patients during a 6-month period. Diabetes distress was measured within 24 hours of admit using the 17-item Diabetes Distress Scale composed of 4 subscales (emotional burden, physician distress, regimen distress, interpersonal distress). Patient characteristic data included age, years with diabetes, and A1C.

Results: Diabetes distress was identified in 42 of 220 (19%) subjects. Findings from this study identified A1C and length of diabetes as independent predictors of diabetes distress. Although the majority (178/220, 81%) of subjects did not report an overall score indicating diabetes distress, 22% reported distress for emotional burden, and 15% reported regimen distress.

Conclusion: Future postdischarge diabetes distress program development should target strategies to reduce emotional burden and regimen distress for all diabetics, especially those with elevated A1C and a long history of diabetes.

Table. Patient Characteristics and Diabetes Distress

Variable	Overall Diabetes Distress (n=42)	Overall No Diabetes Distress (n=178)	Test	*P* Value
Mean age, years ± SD	61.8 ± 11.9	66.4 ± 13.2	t=2.05	<0.050
Mean years of diabetes mellitus ± SD	18.5 ± 13.1	14.2 ± 9.4	t=-2.01	<0.050
Mean A1C, % ± SD	8.8 ± 2.3	7.6 ± 1.8	t=-3.09	<0.010
Emotional Burden subscale, n (%)	41 (98)	39 (22)	X^2 (1, N=139) = 84.17	<0.001
Physician Distress subscale, n (%)	9 (21)	5 (3)	X^2 (1, N=173) = 19.77	<0.001
Regimen Distress subscale, n (%)	36 (86)	27 (15)	X^2 (1, N=151) = 82.75	<0.001
Interpersonal Distress subscale, n (%)	20 (48)	10 (6)	X^2 (1, N=168) = 50.90	<0.001

86 Implementing Noncontact Low-Frequency Ultrasound in the Management of Deep Tissue Injuries

Tara Clesi, BSN, RN, WOC, COCN

Wound Ostomy and Geriatrics, Ochsner Clinic Foundation, New Orleans, LA

87 Comparing Postoperative Infections in Neuromuscular Scoliosis Posterior Spinal Fusions With and Without Plastic Surgery Closure

Brandon Cook, MD[1,2], David Briski, MD[1,2], Andrew King, MD[3], Joseph Zavatsky, MD[4]

[1]Department of Orthopedic Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, New Orleans, LA [3]Department of Orthopedic Surgery, Louisiana State University Health Sciences Center, New Orleans, LA [4]Department of Orthopedic Surgery, Spine & Scoliosis Specialists, Tampa, FL

Background: Postoperative infections after posterior spinal fusion (PSF) surgery can be potentially devastating. Infection rates after PSF have been reported as high as 23% in neuromuscular scoliosis (NMS) patients. We compared surgically treated neuromuscular scoliosis patients with and without plastic surgery wound closure.

Methods: All NMS patients treated with PSF from 2008 to 2014 with 2-year follow-up were reviewed. Patients were categorized into 2 groups: group 1, plastic closure (PC) included patients with a multilayered closure and advancement flaps when necessary; group 2 was standard closure (SC). Differences in demographic, radiographic, and clinical parameters were analyzed.

Results: Fifty patients met inclusion criteria for the database, of whom 39 had complete 2-year data. Group 1 had 11 patients, each having a multilayered plastic surgery wound closure. Group 2 included 29 patients who had a standard wound closure. There was no difference in age, male sex, number of levels fused, or postoperative maximum coronal Cobb angles between the groups (Table). There was a significant difference in deep space infections (0 vs 7, P=0.0057), revision surgeries (0 vs 7, P=0.0057), EBL (2425 vs 644 cc, P=1.46E-06), OR time (467 vs 245 min, P=1.97E-08), iliac screw fixation (58% vs 21%, P=0.022), and preoperative maximum coronal Cobb angle (58.29° vs 71.99°, P=0.043) in the PC vs SC groups, respectively.

Conclusion: Even with associated risk factors for infection including increased EBL, OR time, and iliac screw fixation, the PC group had significantly less deep space infections and revision surgeries. Utilizing a plastic surgery closure can reduce dead space and provide better soft-tissue coverage of the spinal instrumentation, reducing deep space infections and revision surgery.

Table. Patient Demographics and Outcomes

	Plastic Closure Group n=11	Standard Closure Group n=29	*P* Value
Age, years	15.28	17.39	0.255
Male, %	57	41	0.38
Number of levels fused	14.38	15.5	0.197
Preoperative Cobb max	58.29°	71.99°	0.043
Postoperative Cobb max	26.88°	25.13°	0.704
Estimated blood loss, mL	2,425	644	1.46E-06
Operating room time, minutes	467	245	1.97E-08
Iliac screw fixation, %	58	21	0.022
Deep space infections	0	7	0.0057
Revision surgery	0	7	0.0057

88 Outcomes for Denervation of the Lateral Humeral Epicondyle for Treatment of Chronic Lateral Epicondylitis

Brandon Cook, MD[1,2], Misty Suri, MD[2,3]

[1]Department of Orthopedic Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [3]Department of Sports Medicine, Ochsner Clinic Foundation, New Orleans, LA

Background: Lateral epicondylitis remains a challenging clinical problem that can be debilitating with few treatment options providing little relief. Once conservative measures have failed, open debridement remains the gold standard with mixed results. Denervation of the lateral humeral epicondyle with the excision of the posterior branch of the posterior cutaneous nerve of the forearm may be another option to decrease pain, allowing earlier return to work and sports activities.

Methods: All lateral epicondylitis neurectomies treated by a single surgeon at a single institution from 2013-2015 with a minimum of 1-year follow-up with completed charts were reviewed for VAS preoperatively, 2 weeks postoperatively, and current pain (average of 14 months postoperatively).

Results: Nine patients with 10 neurectomies met inclusion criteria for the database, of whom 8 patients with 9 neurectomies had a minimum of 1-year follow-up. The average follow-up for this group of patients was 14 months. Preoperative VAS averaged 6, 2-week postoperatively the score averaged 1.44, and current pain scores with a mean follow-up of 14 months averaged 0.33. The decrease in overall VAS from preoperative to 2-week postoperative was statistically significant (1.0724E-07) along with VAS scores comparing preoperative to current follow-up with a mean of 14 months (2.00644E-09).

Conclusion: Denervation of the lateral humeral epicondyle via excision of the posterior branch of the posterior cutaneous nerve of the forearm can provide pain relief to patients.

89 Effects of Perioperative Dexamethasone on Patients Undergoing Total Hip or Knee Arthroplasty: Is it Safe for All Patients?

Brian M. Godshaw, MD[1,2], Gary McDaniel, MD[3], Leslie Thomas, MD[2,3], George Chimento, MD[1,2]

[1]Department of Orthopedic Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [3]Department of Anesthesiology, Ochsner Clinic Foundation, New Orleans, LA

Background: Perioperative dexamethasone effectively reduces postoperative nausea and vomiting and aides in analgesia after total joint arthroplasty (TJA). However, systemic glucocorticoid therapy carries the risk of increased susceptibility to prosthetic joint infection (PJI), increased white blood cell (WBC) counts, and increased blood glucose levels. The purpose of this study was to determine the effect of dexamethasone on these complications in diabetic and nondiabetic patients undergoing TJA.

Methods: A retrospective chart review of all patients receiving primary total joint (hip or knee) arthroplasty between January 1, 2013 and December 31, 2015 (n=1,818) was conducted. The patients were divided into 2 main cohorts: those receiving dexamethasone (n=1,426) and those not receiving dexamethasone (n=392). They were further subdivided into diabetics and nondiabetics. The primary outcome was PJI; secondary measures included WBC count and glucose levels. Statistics were carried out using chi-square or ANOVA tests.

Results: Of the 1,818 joints, 1.05% developed PJI without a difference between the dexamethasone and no dexamethasone groups ($P=0.1023$): 0.84% with dexamethasone and 1.79% without dexamethasone. Additionally, there was no effect on the increases in WBC count ($P=0.1784$) or blood glucose ($P=0.3120$). Compared to nondiabetics, diabetics who received dexamethasone had a higher rate of infection (2.1% vs 0.30%, $P=0.0016$) and a greater elevation in blood glucose ($P<0.0001$) but no difference in WBC count ($P=0.6993$).

Conclusion: Perioperative intravenous dexamethasone had no significant effect on the overall rate of PJIs in primary total hip or knee arthroplasty; however, diabetic patients had a significantly higher rate of infection compared to nondiabetics when given dexamethasone. WBC counts were not affected overall by administration of dexamethasone or with stratification into diabetics and nondiabetics. Glucose levels were not affected by administration of dexamethasone.

90 Meniscal Transplantation: Survivorship and Functional Outcomes

Damon Greene, MD[1], Deryk G. Jones, MD[1,2], Benjamin Browning, MD[1], Scott Montgomery, MD[1,2], Misty Suri, MD[1,2], Christopher Flowers, MD[3]

[1]Department of Sports Medicine, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [3]Deparment of Orthopedic Surgery, Ochsner Clinic Foundation, New Orleans, LA

Background: Development of degenerative knee arthritis following total or partial meniscectomy is a described entity. Implantation of meniscal allograft offers a promising alternative to joint replacement in the younger population. The goals of this study were to report the survivorship and outcome of both isolated arthroscopic-assisted meniscal transplantation and combined meniscal transplantation with alignment and cartilage procedures.

Methods: The study design was a retrospective/prospective chart review evaluating medical records and other data collected for nonresearch purposes. Fifty-nine total patients received meniscal allograft transplantation by a single surgeon at our institution. Sixteen total patients were included in the study. Five were isolated meniscal transplants, and 11 were either HTO or HTO/ACI combined procedures.

Results: Survivorship at follow-up (2 years) was 15/16 or 94%. Follow-up was 24 to 101 months (average 36 months). PSF-12, MSF-12, IKDC, and Lysholm were measured, and PSF-12/MSF-12 were not statistically significant for a difference. IKDC and Lysholm scores were statistically significant with preoperative average scores of 38.5 and 49.2 and a postoperative average scores of 59.5 and 66.5, respectively.

Conclusion: Our study shows good survivorship of meniscal allograft transplantation in isolated and combined procedures at 2- to 8-year follow-up. Function scores either remained the same or improved at final follow-up. With the proper indications, meniscal transplantation should remain a viable option in treating younger patients postmeniscectomy with minimal arthritis. Long-term data are still necessary to determine long-time survivorship of meniscal transplantation and the natural history posttransplantation, specifically in the potential protective effects against developing osteoarthritis.

91 Long-Term Follow-Up of Spine Stapling for Scoliosis

Lawrence Haber, MD[1], Daniel Robbins, BS[2], Michael W. Shrader, MD[3]

[1]Department of Orthopedic Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]University of Mississippi Medical Center, School of Medicine, Jackson, MS [3]Department of Orthopedic Surgery, University of Mississippi Medical Center, Jackson, MS

Background: Nitinol staples were used in our children's hospital from 2005-2008. Due to reimbursement issues and questionable effectiveness, we stopped doing the procedure. No study follows a group of patients to skeletal maturity and beyond. This cohort was treated at an institution that has yet to publish its series. Average curve size was larger than in previously published series.

Methods: After institutional review board approval, a retrospective chart and radiographic review was done on 14 consecutive AIS patients treated with spine stapling for AIS between 2005-2008. Radiographs and charts were reviewed to attain standard radiographic, surgical, and follow-up data.

Results: Thirteen patients with 15 curves were identified. One, not progressing, was excluded due to lack of follow-up to skeletal maturity. Average preoperative curve size was 34.8 (range, 28-43). Ten were Risser 0, and 3 were Risser 1. Average operating room time was 195 minutes (range, 114-294 minutes). EBL was 114 (range, 25-500). Levels stapled/curve were 5.67 (range, 4-7). Average first postoperative erect Cobb was 23.7 (range, 8-35). Average improvement first erect film was 10.8 (range, 0-24). Average follow-up was 61 months (range, 37-95 months). Analysis revealed 3 groups. In group 1, 8 curves showed improvement of an average of 7.3 degrees (range, 4-13). Group 2 showed 4 curves with progression <5 degrees. Group 3 showed 3 patients with 3 curves that progressed to fusion. There was one staple dislodgement that was revised thorascopically. No other complications were noted.

Conclusion: Nitinol staples were safe long term. Only 3 patients went to fusion in this high-risk group. Growth modulation, although present in some, was inconsistent. In many, the staples had initial correction, some of which was lost over time, and acted more as an internal brace. As growth modulation technologies continue to evolve, long-term studies such as this one are critical to prove safety and effectiveness.

92 Who Needs a Pediatric Intensive Care Unit After Posterior Spine Fusion for Idiopathic Scoliosis

Lawrence Haber, MD[1], Erika Womack, PhD[2], Michael W. Shrader, MD[2], Kumar Sathyamoorthy, MD[3]

[1]Department of Orthopedic Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]Department of Orthopedic Surgery, University of Mississippi Medical Center, Jackson, MS [3]Department of Anesthesiology, University of Mississippi Medical Center, Jackson, MS

Background: Hypotensive events (HEs) following posterior spinal fusion (PSF) for adolescent idiopathic scoliosis (AIS) can lead to delayed neurologic postoperative deficits (DNPD). This study aimed to determine the incidence of HEs (mean arterial pressure [MAP] $<$60 mmHg) after PSF for AIS and identify predictors for HEs.

Methods: Medical records of 99 consecutive patients who had PSF for AIS were retrospectively reviewed (2011-2013). Perioperative data were collected. Patients were divided into 2 groups based on MAP readings by an arterial line in the pediatric intensive care unit (PICU) immediately postoperatively (PO) and into PO day 1: group 1 (MAP $\geq$60 mmHg) and group 2 (multiple occurrences of MAP $<$60 mmHg). Mean values were compared using the independent *t* test. Multiple logistic regression was used to estimate the association of preoperative and intraoperative parameters with multiple HEs.

Results: Group 1 had 68 patients (68.7%), and group 2 had 31 patients (31.3%). None of the parameters associated significantly with multiple HEs. However, patients who did not exhibit HEs within the first 4 hours PO remained stable throughout the rest of the PO period. Only those with HEs in the first 4 hours experienced subsequent HEs. There were no DNPD or other major complications.

Conclusion: The incidence of HEs after PSF in AIS can be as high as 31.3%. We did not find any significant risk factors. Although the overall rate of DNPD after PSF is a rare complication and we had none in this series, we suggest that patients with multiple HEs may be at risk for DNPD due to hypotension and potential for cord ischemia. Therefore, all patients after PSF should be monitored in a PICU-type environment or postanesthesia recovery room initially. If stable for at least the initial 4 hours, then patients should be good candidates for a less intensive environment.

93 Retrospective Chart Review of Hip Function After Arthroscopic Iliopsoas Tenotomy in Patients With Total Hip Arthroplasty

Michael Casale, MD[1,2], Damon Greene, MD[3], Misty Suri, MD[2,3]

[1]Department of Orthopedic Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [3]Department of Sports Medicine, Ochsner Clinic Foundation, New Orleans, LA

Background: The purpose of this study was to present our arthroscopic surgical technique and results after arthroscopic iliopsoas release secondary to iliopsoas impingement (IPI) after total hip arthroplasty (THA).

Methods: Between 2011 and 2016, 8 patients with prior THA and clinically diagnosed IPI were identified. Each patient underwent arthroscopic release. Patients were evaluated postoperatively with both subjective and objective scores. Follow-up varied among patients, with the longest duration being 2 years and the shortest approximately 3 months.

Results: Comparing preoperative and postoperative visual analog score (VAS), Harris Hip Score (HHS), and SF-12 Physical (PSF) and Mental (MSF) health scores using a paired *t* test, there was a statistically significant improvement in VAS, HHS, SF-12 PSF, and SF-12 MSF. The mean preoperative VAS was 5.9 (out of 10), and the mean postoperative score was 1.5. Likewise, HHS increased from 59.0 preoperatively to a mean of 77.2 postoperatively. Additionally, there was a statistically significant improvement in SF-12 PSF and MSF scores when comparing preoperative scores with average postoperative scores.

Conclusion: In patients with persistent pain during hip flexion activities after THA, iliopsoas tendonitis should be considered as a cause. The results of our study show that arthroscopic iliopsoas tenotomy is a safe and effective treatment for iliopsoas tendonitis, resulting in decreased pain levels and increased functional capacity.

94 Hip Arthroscopy in Obese Patients: Is There a Functional Difference in Outcomes?

Misty Suri, MD[1,2], Damon Greene, MD[1], Brian M. Godshaw, MD[2,3], Benjamin Browning, MD[1], Deryk G. Jones, MD[1,2], Scott Montgomery, MD[1,2], Dara Fulstone, MPH[3], Stephanie Pawlak, BS[1]

[1]Department of Sports Medicine, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [3]Department of Orthopedic Surgery, Ochsner Clinic Foundation, New Orleans, LA

Background: Obesity rates have continued to increase across the globe and, as of 2008, >10% of adults were estimated to be obese. Previous studies have suggested poorer outcomes after hip arthroscopy as body mass index (BMI) increases. Our study looks at the effect of obesity on the outcomes of patients undergoing hip arthroscopy at our institution.

Methods: At a single institution, data were retrospectively reviewed from 484 consecutive patients undergoing hip arthroscopy from 2008-2016. The Harris Hip Score (HHS) and Short Form 12 (SF-12) scores were used to measure outcomes. Scores were collected at 7 intervals: preoperatively and postoperatively at 6 weeks, 3 months, 6 months, 1 year, 2 years, and 3 years. The patients were stratified into 4 cohorts based on their BMI: underweight with BMI <18.5 (16 patients), normal with BMI 18.6-24.9 (217 patients), overweight with BMI 25-29.9 (147 patients), and obese with BMI >30 (83 patients). Statistics were performed using multivariable analysis of variance Wilks lambda test, with $P<0.05$ being significant.

Results: An overall improvement in HHS was found postoperatively compared to preoperatively from 57.1 to 84.2 ($P=0.004$). This trend also held true in each BMI category. During the 3-year follow-up, the underweight had the greatest improvement in HHS (30.8), physical SF (23.6), and mental SF (7.9), with the normal group showing greatest iHOT improvement (5.9). However, no relationship between the patients' BMI and their outcome in either score was found ($P>0.05$).

Conclusion: In contrast to previous studies, this study shows that BMI had no effect on patient outcomes. All patients in different BMI categories had improvement in hip scores over time, with no statistical difference between them.

95 Hip Arthroscopy in Patients With Legg-Calve-Perthes Disease and Slipped Capital Femoral Epiphysis: Is There a Difference in Functional Outcomes?

Misty Suri, MD[1,2], Damon Greene, MD[1], Brian M. Godshaw, MD[2,3], Benjamin Browning, MD[1], Deryk G. Jones, MD[1,2], Scott Montgomery, MD[1,2], Dara Fulstone, MPH[3], Stephanie Pawlak, BS[1]

[1]Department of Sports Medicine, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [3]Department of Orthopedic Surgery, Ochsner Clinic Foundation, New Orleans, LA

Background: Slipped capital femoral epiphysis (SCFE) and Legg-Calve-Perthes disease (LCPD) have been shown to have long-term deleterious effects on the hip joint. Hip arthroscopy can successfully treat traumatic hip pathologies such as labral tears, femoral-acetabular impingement, and osteonecrosis. We looked at patients with the preexisting conditions of SCFE or LCPD to see what outcomes hip arthroscopy would have on those patients.

Methods: At a single institution, data were retrospectively reviewed from 484 consecutive patients undergoing hip arthroscopy from 2008-2016. The Harris Hip Score (HHS) and Short Form 12 (SF-12) scores were used to measure outcomes. Scores were collected preoperatively and postoperatively at 6 weeks, 3 months, 6 months, 1 year, 2 years, and 3 years. The patients were stratified into 2 cohorts: those with a history of SCFE or LCPD (25 patients) and those with no history of SCFE or LCPD (448 patients); these data were unavailable for 11 patients. Statistics were performed using multivariable analysis of variance Wilks lambda test with $P<0.05$ being significant.

Results: An overall improvement in HHS was found at 3 years compared to preoperatively from 57.1 to 84.2 ($P=0.004$). An overall improvement in all scores was noted for both the SCFE/LCPD and control groups at 3 years compared to preoperatively; however, the SCFE/LCPD group had a smaller absolute improvement. When compared to the control group, the SCFE/LCPD group had significantly worse outcomes ($P=0.046$).

Conclusion: Patients with a history of SCFE or LCPD disease have worse functional outcomes after hip arthroscopy compared to patients without those preexisting conditions. However, SCFE and LCPD patients do show functional improvement after surgery compared to their preoperative scores.

96 Hip Arthroscopy in Patients With a History of Cigarette Use: Is There a Difference in Functional Outcomes?

Misty Suri, MD[1,2], Damon Greene, MD[1], Brian M. Godshaw, MD[2,3], Benjamin Browning, MD[1], Deryk G. Jones, MD[1,2], Scott Montgomery, MD[1,2], Dara Fulstone, MPH[3], Christian Nguyen, BS[3], Stephanie Pawlak, BS[1]

[1]Department of Sports Medicine, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [3]Department of Orthopedic Surgery, Ochsner Clinic Foundation, New Orleans, LA

Background: It is well documented that cigarette smoking is a risk factor for patients. Smoking increases anesthetic-related risks as well as the risk of complications during the surgery and during the recovery period. Currently, there is limited literature on the effects of cigarette smoking and hip arthroscopy outcomes.

Methods: At a single institution, data were retrospectively reviewed from 484 consecutive patients undergoing hip arthroscopy from 2008-2016. The Harris Hip Score (HHS) and Short Form 12 (SF-12) scores were used to measure outcomes. Scores were collected at 7 intervals: preoperatively and postoperatively at 6 weeks, 3 months, 6 months, 1 year, 2 years, and 3 years. Patients were stratified into 4 cohorts: never smoked, former smokers, current smokers, and smoking status not assessed. Statistics were performed using multivariable analysis of variance Wilks lambda test with $P<0.05$ being significant.

Results: Of the 484 patients in the database, 407 were $\geq$18 years old (legal smoking age). The majority of patients, 67.1% (273), were reported to have never smoked, 15.2% (62) of patients were reported to be former smokers, 11.1% (45) of patients were reported to be current smokers, and 6.6% (27) of patients never had their smoking status assessed. Overall, we found an improvement in HHS at 3 years compared to preoperatively from 57.1 to 84.2 ($P=0.004$). However, there were no significant correlations between smoking status and changes in mean postoperative pain outcome scores ($P>0.05$).

Conclusion: The results of this study suggest that smoking status (current, former, or never) has no correlation to increased pain after hip arthroscopy. Similarly, smoking status does not appear to have any effect on the functional outcomes of the patient.

97 Accuracy of Magnetic Resonance Imaging for Preoperative Assessment of Patellar Tendon Length Prior to Anterior Cruciate Ligament Reconstruction

Mohanned A. Alnammi, MD[1], Damon Greene, MD[2], Ernest Rudman, MD[1], Deryk G. Jones, MD[2,3], Misty Suri, MD[2,3], Scott Montgomery, MD[2,3]

[1]Department of Radiology, Ochsner Clinic Foundation, New Orleans, LA [2]Department of Sports Medicine, Ochsner Clinic Foundation, New Orleans, LA [3]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Anterior cruciate ligament (ACL) injury affects an estimated 200,000 patients annually, with 100,000 undergoing ACL reconstruction. The choice of graft can be allograft or autograft with bone-patellar tendon-bone considered by many to be the graft of choice. The size of the native patellar tendon may be a limiting factor in graft selection. We hypothesized that preoperative measurement of patellar tendon length is an accurate technique compared to intraoperative measurement. Awareness of this anatomic dimension may optimize preoperative planning for the orthopedic surgeon.

Methods: Twenty-eight patients with ACL tears who underwent a bone-patellar tendon-bone reconstruction were prospectively evaluated. Patellar tendon length and width were assessed in the operating room in standard knee position and at standard locations by an experienced orthopedic surgeon. Magnetic resonance images (MRI) were reviewed by an experienced musculoskeletal radiologist blinded to intraoperative measurements.

Results: Univariate statistical analysis was performed. Proximal width showed a mean variation of 0.17 mm, standard deviation 0.08 mm, standard error of mean 0.02 mm, and confidence interval (CI) 0.01 to 0.05. Middle width showed a mean variation of 0.07 mm, standard deviation 8.86 mm, standard error of mean 1.67 mm, and CI 3.36 to 3.51. Distal width showed a mean variation of 4.28 mm, standard deviation 14.15 mm, standard error of mean 2.67 mm, and CI 1.20 to 9.77. Length showed a mean variation of 6.86 mm, standard deviation 14.56 mm, standard error of mean 2.75, and CI 0.60 to 11.89.

Conclusion: A statistically significant correlation was found for patellar tendon length measurement at arthroscopy and MRI. Our recommendation is that further study is needed with a larger sample size to conclude feasibility of MRI accuracy preoperatively.

98 Dominant Shoulder Pain and Altered Shoulder Rotation in Adolescent Cricket Players

Nicholas L. Kolodychuk, MS[1], Manit Arora, MBBS[2]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Department of Orthopedics, Bond University, Queensland, Australia

99 The Relationship Between Surface Area and Viability With the Submental Island Flap

Blair M. Barton, MD[1], Charles Riley, MD[1], Jason Pou, MD[1], Christian Hasney, MD[2,3], Brian Moore, MD[2,3]

[1]Department of Otolaryngology, Tulane University School of Medicine, New Orleans, LA [2]Department of Otolaryngology, Ochsner Clinic Foundation, New Orleans, LA [3]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: The submental island flap (SIF) is a pedicled flap that is used for reconstruction of numerous head and neck defects. The relationship between the surface area and viability of the flap has not been previously studied.

Methods: A prospective case series review was performed on 37 consecutive patients undergoing SIF reconstruction following ablative surgery for malignancy at a single, tertiary care facility between November 2014 and November 2016. Preoperative, intraoperative, and postoperative variables and outcomes were examined.

Results: Thirty-seven patients met inclusion criteria. Twenty-nine were male; the average age was 64.2 ($\pm$12.4) years. Eighteen cancers involved the oral cavity, 11 involved skin, and 8 were in the oropharynx. The average size of the SIF was measured 38.8 cm^2 ($\pm$17.6 cm^2). Four partial flap losses occurred. No revision surgery was necessary. There was no correlation between flap size and postoperative complication.

Conclusion: The SIF is a robust flap that can be reliably utilized for a variety of head and neck defects following tumor ablation with an acceptable rate of donor- and flap-related complications.

100 Are Pediatricians Diagnosing Obese Children?

Nikita Lalchandani, BS[1], Katharine Thomas, MD[2], Fernando Urrego, MD[1,3]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Department of Internal Medicine, Ochsner Clinic Foundation, New Orleans, LA [3]Department of Pediatrics, Ochsner Clinic Foundation, New Orleans, LA

Background: Pediatric obesity is the most prevalent nutritional disorder in American children. The detrimental social, psychological, and physiological effects of obesity call for pediatricians to address this health concern. The literature demonstrates that clinicians are underreporting the diagnosis of obesity in the pediatric setting. The primary purpose of this study was to determine if pediatricians at one pediatric clinic in the Ochsner Health System were documenting the presence of an overweight or obese body mass index (BMI) as a diagnosis in the medical record. A secondary purpose of this study was to determine the demographics of all pediatric patients in the Ochsner Health System to be used for program development.

Methods: A retrospective medical record review was conducted. Records from April 1, 2012 to April 1, 2016 were reviewed for the presence of the diagnosis of BMI classified as obese or overweight.

Results: We analyzed a total of 175,066 records in this study. Of these records, 1.32% documented a diagnosis of obesity and 0.5% documented a BMI score indicating overweight. The actual percentage of patient visits that met the Centers for Disease Control and Prevention criteria to be classified as obese or overweight was 28.66% and 30.41%, respectively. The majority of our pediatric patients are male (51.76%), white (43.31%), and 5-12 years old (43.80%).

Conclusion: This study demonstrates that pediatricians at Ochsner Health Center for Children are not diagnosing patients who have unhealthy BMI scores as overweight or obese. Interventions are needed to increase the identification of children who may benefit from receiving resources that encourage a healthy lifestyle and optimal weight maintenance.

101 Pharmacist-Driven Disease State Management Clinic: A Proposal

Poonam Kukreja, PharmD[1], Elisa Supan, PharmD[1], Monica Morgan, PharmD[2]

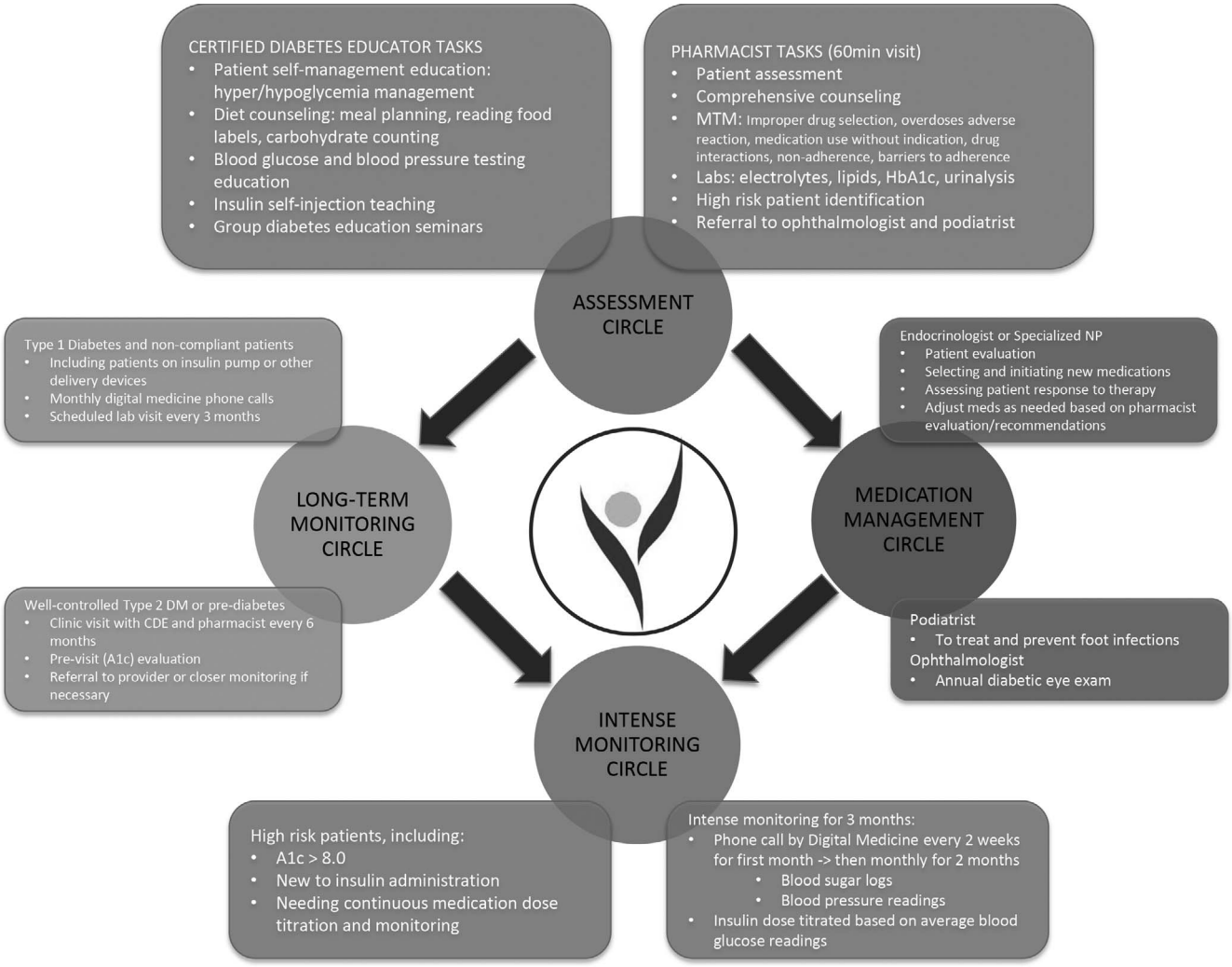
[1]Department of Pharmacy, Ochsner Medical Center, Kenner, LA [2]Department of Pharmacy, Ochsner Clinic Foundation, New Orleans, LA

Background: The healthcare environment has been continuously evolving, altering the roles and contributions of a pharmacist. In this era of healthcare reform, the level and scope of pharmacy practice have expanded to include direct patient care and disease state management services. Significant published evidence supports the role of the pharmacist as an essential member of the interdisciplinary healthcare team. Pharmacists are well trained and positioned to perform medication and wellness-related interventions that improve patient outcomes, especially in the field of chronic disease state management. Ever-increasing healthcare costs are directing focus toward value-based services and team-based approaches to patient care. Federal and state agencies are promoting numerous initiatives to show how pharmacist involvement can improve therapeutic outcomes and adherence to medications, ultimately reducing healthcare costs. The objective of this project was to create a model for a pharmacist's role in a disease state management clinic.

Methods: To promote the involvement of pharmacist in direct patient care, BCDPHP partnered with Ochsner Health System to design and implement a pilot program. The project utilized a pharmacist in a primary care clinic to promote adherence counseling, medication reconciliation services, and evidence-based medication recommendations to the patient and primary care staff.

Results: A model of a pharmacist-driven disease state management clinic was created.

Conclusion: The pharmacist-driven disease state management clinic can bridge the gap between healthcare modalities and improve patient care by improving follow-up frequency, enhancing medication compliance, and providing direct one-on-one patient education, which may otherwise be lacking. The disease state clinic model that was created will benefit healthcare professionals, reduce costs, and most important, improve patient outcomes.



102 In Probes We Trust? Saturation Accuracy Between Two Oximeter Probes and Arterial Blood Gas in a Pediatric Intensive Care Unit

Joshua C. Brooks, MPH[1], Tara Williams, RN[2], Kylie Pearson, RN[2], Deborah Long, RN[2], Deborah Pegg, RN[2], Maria Harkin, RN[2], Trang Pham, PhD[3], Andreas Schibler, MD[2]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Pediatric Intensive Care Unit, Lady Cilento Children's Hospital, Brisbane, Australia [3]Centre for Children's Health Research, Lady Cilento Children's Hospital, Brisbane, Australia

Background: Transcutaneous oxygen saturation (SpO_2) is used daily clinically to measure/monitor blood oxygen levels. Recent research indicates oximeter probe readings poorly correlate with arterial blood gas (ABG) values. The aim of this study was to assess the accuracy of Masimo (M) and Nellcor (N) probes compared to ABGs in the pediatric intensive care unit (PICU).

Methods: SpO_2 values were prospectively collected/validated along with ABGs in children 0-16 years old with an arterial line at the Lady Cilento Children's Hospital PICU. M and N oximeter probes were placed on the same limb as the arterial line, and values were compared with ABGs. ANZPIC diagnosis codes, inotropes, respiratory disease/support, cardiovascular disease severity/support, volume status, and perfusion status were collected.

Results: A total of 3,802 events of matched M and N SpO_2 and ABGs were documented in 333 patients. Eighty-five patients had principal postoperative cardiac surgery diagnoses, 29 had cardiac diagnoses, and 219 had noncardiac diagnoses. Bland-Altman plot statistics showed the mean percentage differences between the M and N probes and ABG were 1.50 ± 4.50 (range, -36-50, 95% confidence interval [CI] 1.45-1.55) and 0.57 ± 4.97 (range, -77-47, 95% CI 0.53-0.61), respectively. Overall, 12% M and 15% N SpO_2 values lay outside a clinically acceptable $\pm$5% ABG, with approximately 10% of those $>$5%. In cardiac surgery patients, 11% M and 12% N values were outside $\pm$5% of ABG (9% of both probes $>$5%). In cardiac patients, 12% M and 14% N values were outside $\pm$5% of ABG (10% and 9% $>$5%, respectively). In noncardiac patients, 14% M and 17% N values were outside $\pm$5% ABG (12% of values $>$5%).

Conclusion: Despite overall good statistical agreement between SpO_2 and ABG, the results indicated an unacceptable 10% of SpO_2s overestimated ABG by $>$5%. Important clinical decisions for short- and long-term management are based on SpO_2 measurement. Hence, an urgent improvement of the technology is needed.

103 Critical Collaboration: The Science of Liberation in the Intensive Care Unit

Fiona Winterbottom, DNP, MSN, APRN, ACNS-BC, CCRN

Department of Pulmonary/Critical Care, Ochsner Clinic Foundation, New Orleans, LA

Background: Several studies have shown that liberating patients from the ventilator by limiting deep sedation, awakening patients daily for spontaneous breathing trials, assessing for delirium, progressing mobility, and encouraging family involvement in care have effects on short-term and long-term quality of life and survival. Increased compliance with elements of the intensive care unit (ICU) Liberation bundle leads to increased survival and quality-of-life benefit.

Methods: In 2016, the Ochsner Health System ICUs were brought together through the Tele-ICU and System Critical Care Council to implement the ICU Liberation bundle. A series of 4 in-person project sessions and monthly phone meetings were scheduled. Each interdisciplinary team attended sessions where they were introduced to the science, reviewed performance improvement basics, and learned how to interpret quality data. Each team chose one part of the bundle for a small quality improvement project. A decrease of 5% ventilator days was selected as a measure of success.

Results: Major results included qualitative outcomes to permit future quantitative measurement, including creation of a website for information sharing, development of a ventilator order set, design of an interdisciplinary electronic flowsheet for documentation and reporting, establishment of a clinical practice guideline for mobility with invasive devices, purchase of equipment to assist patients when walking, and sharing of knowledge between system ICUs. ICUs that realized at least a 5% decrease in ventilator days included Baptist (-145), Baton Rouge (-100), Kenner (-133), Northshore (-94), and SICU-OMC (-69). CMICU-OMC and NSCCU-OMC both had increases in ventilator days of 500 and 1,759, respectively. Each team created a poster to disseminate their success.

Conclusion: Each ICU team saw improvements in process of care for selected intervention. Future plans aim to implement and measure adherence to all ICU bundle elements.

104 Patient Surveillance and Predictive Modeling to Identify Patients at Risk of Decline

Fiona Winterbottom, DNP, MSN, APRN, ACNS-BC, CCRN

Department of Pulmonary/Critical Care, Ochsner Clinic Foundation, New Orleans, LA

Background: Healthcare institutions are under pressure to take care of increasing numbers of patients with complex diseases and multiple comorbidities while workforce supply is diminishing. The electronic health record (EHR), in conjunction with predictive modeling, can take specific data sets and utilize them to predict future trends that can positively impact patient care, clinical interventions, staffing, and cost reduction.

Methods: The purpose of this analysis was to evaluate if predictive modeling can be used to enhance identification of patients at risk of decline. Twelve quarterly data sets (n=96) from 2013 to 2016 were generated from the data warehouse and EHR from 8 intensive care units (ICUs) in 5 hospitals. Data were analyzed for trends related to system stress. System stress variables included APACHE score, ventilator days, ICU length of stay (ICU LOS), hospital length of stay (hospital LOS), and mortality. ICU and hospital LOS were categorized using APACHE scores to determine high-risk or low-risk severity of illness. Multivariate regression was used to test predictors of mortality.

Results: In patients with low-risk severity of illness, ICU LOS and hospital LOS significantly predicted mortality, $\beta=0.54$, $t(93)=3.84$, $P<0.0001$. ICU LOS and hospital LOS also explained a significant proportion of variance in mortality, $R^2=0.39$, $F(1,93)=14.75$, $P<0.0001$. APACHE scores and ventilator days were not predictive ($P>0.05$).

Conclusion: EHR and predictive modeling have the capacity to be used for patient surveillance that focuses both on LOS and severity of illness. However, this model suggests that heightened attention on low-risk patients may reduce mortality.

105 Assessing Poor Response to DEB-TACE: The Role of Tumor Biology in the Primary Treatment Response of Hepatocellular Carcinoma

Tyler Sandow, MD[1], Stephen Arndt, MD[1], Paul Gulotta, MD[1], Humberto Bohorquez, MD[2,3], Paul T. Thevenot, PhD[4], Kelley G. Núñez, PhD[4], Daniel DeVun, MD[1,3], David Kirsch, MD[1,3], Juan Gimenez, MD[1], Patrick Gilbert, MD[1], Gretchen Galliano, MD[5], Ari Cohen, MD[2,3], Dennis Kay, MD[1,3], George Loss, MD, PhD[2,3]

[1]Department of Radiology, Ochsner Clinic Foundation, New Orleans, LA [2]Multi-Organ Transplant Institute, Ochsner Clinic Foundation, New Orleans, LA [3]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [4]Institute of Translational Research, Ochsner Clinic Foundation, New Orleans, LA [5]Department of Pathology, Ochsner Clinic Foundation, New Orleans, LA

Background: This study compares the response to transarterial chemoembolization with drug-eluting beads (DEB-TACE**)** in patients with hepatocellular carcinoma (HCC), using explant findings for tumor morphology.

Methods: A retrospective analysis was performed on all patients who were treated for HCC with DEB-TACE (100-300μ LC Bead mixed with 50-75 mg doxorubicin) and underwent subsequent transplantation. The endpoint of each treatment was near-complete stasis. Ninety-three patients had posttreatment imaging performed prior to transplantation, and treatment response was based on modified RECIST assessment. Follow-up imaging was performed 1 month after treatment. HCC was confirmed on explant in 84 patients (9 patients demonstrated complete necrosis, prohibiting tumor grade classification). Effective treatment dose (doxorubicin dose delivered/tumor size) and tumor grade were compared to the primary treatment response.

Results: The tumors in patients who had a favorable treatment response (complete response [CR] or partial response [PR]) on imaging were more likely to be grade 1/grade 2 as opposed to grade 3/grade 4 (98.4% vs 1.6%, $P<0.0001$). Grade 1/grade 2 tumors showed a favorable treatment response in 83% of patients (CR, 33%; PR, 50%; stable disease [SD], 17%) as opposed to 11% of poorly differentiated (grade 3/grade 4) tumors (CR, 0%; PR, 11%; SD, 89%; $P<0.0001$). Higher effective treatment doses were associated with a favorable treatment response: 25.3 mg/cm in patients with CR, 22.1 mg/cm in patients with PR, and 14.2 mg/cm in patients with SD, $P=0.0001$.

Conclusion: Poor response may be associated with unfavorable tumor features and lower treatment doses. These patients may benefit from early consideration for other locoregional treatments.

106 Bullying in the Radiology Workforce

Edward Bluth, MD,[1,2] Joseph Savoie, MHA[1]

[1]Department of Radiology, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: The incidence of bullying in the healthcare workplace is reported to be more common than in other industries and is reported to approach 50%. Bullying behavior may involve abuse, humiliation, intimidation, or insults; it is usually repetitive and causes distress in victims. Potential consequences of bullying in the workplace include anxiety, depression, and health problems in victims, as well as harm to patients as a result of the victim's reduced ability to concentrate. Bullying can also lead to reduced morale and high turnover. To our knowledge, there has never been a specific survey directed toward the diagnostic radiology workforce.

Methods: A short survey was designed and developed and approved by the institutional review board. The survey was administered to approximately 234 members of the radiology department, including staff radiologists, residents, technologists, nurses, administrators, and support staff. The survey consisted of 6 short multiple choice questions.

Results: A total of 101 individuals completed the survey (43% response rate). Twenty-nine percent of individuals personally reported experiencing bullying. A higher incidence (39%) reported that they had observed bullying of other individuals in the department. Sources of bullying were technologists (31%); radiologists (22%); referring MDs, nurses or PAs (22%); administrators (18%); and radiology nurses (6%). Twenty-six percent of individuals reported that they believe that the incidence of bullying has changed during their employment at the Ochsner Health System. Sixty-seven percent of these individuals reported that the incidence was decreasing.

Conclusion: Bullying does appear to occur in the radiology workplace, but it is less than the reported incidence in the hospital overall. The first step to address this issue is educating all components of the hospital environment to this potential problem.

107 NIHSS >10 Is Associated With Worse Outcome Following Urgent Carotid Intervention

Esther Mihindu, DO[1], Mustafa Alhasan, MD[2], Bethany Jennings, NP-C[3], Taylor A. Smith, MD[1,4], Clayton Brinster, MD[1], James Milburn, MD[2], W.C. Sternbergh, MD[1,4], Hernan A. Bazan, MD[1,4]

[1]Department of Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]Department of Radiology, Ochsner Clinic Foundation, New Orleans, LA [3]Department of Neurology, Ochsner Clinic Foundation, New Orleans, LA [4]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Recent data suggest that urgent carotid intervention after transient ischemic attack or stroke can be performed safely in select patients. We aimed to determine whether increased stroke severity on presentation is associated with poor outcome in patients undergoing urgent carotid endarterectomy (CEA) or carotid artery stenting (CAS).

Methods: This retrospective review of urgent carotid interventions was performed between 2013 and 2016. Acutely symptomatic patients with large penumbra/small core infarct underwent urgent CEA or CAS. Admit stroke severity was determined using National Institutes of Health Stroke Scale (NIHSS) score. Endpoints of outcomes were discharge NIHSS, modified-Rankin scale (mRS) score, 30-day stroke, myocardial infarction, and death rates. Paired *t* test and chi-square analysis were used to determine significance between groups.

Results: A total of 108 patients underwent urgent CEA or CAS with a mean time to intervention of 2.9 days (range, 0-15). Most presenting strokes were minor or moderate, with a mean admit NIHSS of 5.1 (range, 0-27). A significant improvement to a mean discharge NIHSS of 3.1 (range, 0-28) was noted for the entire cohort (P=0.0005). Mean mRS score at discharge was 1.5 (range, 0-6). In this cohort, 75% (81/108) of patients had an mRS $\leq$2, representing functional independence upon discharge. Overall complication rate was 11% (12/108), including intracerebral hemorrhage (n=4), death (n=3), stroke (n=3), and MI (n=2). Of the 12 patients who had complications, 5 patients had an NIHSS score >10. The overall rate of complications for patients with an NIHSS >10 was 27.8% (5/18) compared to 7.5% (7/93) for patients with an NIHSS $\leq$10. An NIHSS >10 was associated with a larger risk of a periprocedural complication compared to an NIHSS $\leq$10 (P=0.014).

Conclusion: Patients undergoing urgent CAS or CEA who have an NIHSS $\leq$10 and present with an ischemic penumbra and a small core infarct demonstrate improved outcomes compared to similar patients presenting with NIHSS >10.

108 Role of Magnetic Resonance Imaging Response to Neoadjuvant Chemotherapy in Predicting Postmastectomy Radiotherapy

Genevieve A. Hayek, MD[1], Amy Rivere, MD[1], Aimee Mackey, MD[1], Phillip Feliciano, BA[2], Tara Saxena, BS[2], Lauren Slattery, BS[2], Jessica Bruggers, PA-C[1], Ralph Corsetti, MD[1,2]

[1]Department of Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Magnetic resonance imaging (MRI) is often the imaging modality used to assess neoadjuvant chemotherapy (NCT) response for breast cancer. No studies to our knowledge have identified its role in predicting the use of postmastectomy radiation therapy (PMRT). We sought to identify whether or not response to NCT as shown by MRI was an independent predictor of receiving PMRT.

Methods: A retrospective review was completed using our institutional breast cancer database. Patients who received NCT and underwent mastectomy from 2006-2015 were evaluated. Those who underwent post-NCT breast MRI were selected. Radiologic response was classified as no response (NR), partial response (PR), and complete response (CR). Other variables analyzed were age at diagnosis, tumor size, final pathologic stage, receptor status, and race.

Results: Of patients who received NCT and had mastectomy with or without reconstruction (n=159), 51 also had an MRI as part of their workup. Our data showed no statistically significant association between the response seen on MRI and receiving PMRT. However, triple negative receptor status (P=0.035) and final pathologic stage (P=0.006) both were independent predictors of receiving PMRT. On multivariate analysis, no independent variables were identified.

Conclusion: Our data show that MRI response to NCT is not a good predictor of receiving PMRT. MRI is routinely used to assess response to NCT; however, in patients undergoing mastectomy, MRI may be less useful clinically. More research is needed to identify predictors of PMRT, particularly in patients who undergo mastectomy with immediate reconstruction, as PMRT may have particularly deleterious effects on an immediately reconstructed breast.

Table. Role of MRI Response to NCT in Predicting PMRT

	No PMRT	PMRT	N
No response	4 (26.67%)	11 (73.33%)	15
Partial response	5 (15.62%)	27 (84.38%)	32
Complete pathologic response	2 (50%)	2 (50%)	4

P=0.18

109 Is Breast Reconstruction Worth the Wait? Improved Timing of Breast Cancer Treatment With Neoadjuvant vs Adjuvant Chemotherapy

Jeffanne E. Millien, MD[1], Aimee Mackey, MD[1], Amy Rivere, MD[1], Genevieve A. Hayek, MD[1], Jessica Bruggers, PA-C[1], George M. Fuhrman, MD[1], Ralph Corsetti, MD[1,2]

[1]Department of Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Current data suggest that the timing and delivery of adjuvant chemotherapy (ADJ) impact breast cancer outcomes. Utilization of neoadjuvant chemotherapy (NCT) may influence treatment initiation. We performed this study to evaluate if the type of surgery affects time from diagnosis to surgery and chemotherapy.

Methods: We prospectively reviewed a retrospective database to identify patients treated with chemotherapy for invasive breast cancer from 2006-2014. Patients were divided into 4 groups based on surgery type: lumpectomy (lump), mastectomy alone (mast), mastectomy with implant reconstruction (mast + IR), and mastectomy with flap reconstruction (mast + flap), with subsets of NCT vs ADJ patients. We compared times from diagnosis to surgery and from surgery to ADJ with times from diagnosis to NCT and from last chemotherapy to surgery.

Results: We identified 707 patients: 206 underwent NCT, and 499 underwent ADJ. The subjects were divided into surgical subgroups: 204 ADJ lump, 69 NCT lump, 134 ADJ mast, 84 NCT mast, 84 ADJ mast + IR, 26 NCT mast + IR, 69 ADJ mast + flap, and 22 NCT mast + flap. In the ADJ group, average time to surgery was 25.9 and 48.6 days (lump vs mast+ flap, respectively). Average time from surgery to chemotherapy in the ADJ group for mast + flap was 62 days. The NCT group had shorter times from diagnosis to chemotherapy and last chemotherapy to surgery (28 and 45 days, respectively).

Conclusion: The ADJ group had longer times to intervention, both in the time from diagnosis to surgery and from surgery to chemotherapy for those undergoing reconstruction, while the NCT group had minimal variability in both settings. Factors including scheduling coordination between specialties and postoperative complications after reconstruction may delay initiation of adjuvant treatment. Prior literature demonstrated delays in surgery and chemotherapy impact outcomes; therefore, NCT should be considered for patients undergoing reconstruction who meet the criteria.

110 Tailored Approach to Gastroparesis Significantly Improves Symptoms

Lauren Arthur, MD[1], Lauren Slattery, BS[1], William S. Richardson, MD[1,2]

[1]*The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA* [2]*Department of Surgery, Ochsner Clinic Foundation, New Orleans, LA*

Background: Gastroparesis is difficult to treat, and many patients do not get relief of symptoms with medical therapy alone. Several operative approaches have been described. This study shows the result of our selective surgical approach for patients with gastroparesis.

Methods: This retrospective chart review included patients who had a preoperative gastric emptying study showing gastroparesis, esophagogastroduodenoscopy (EGD), and either computed tomography or upper gastrointestinal series with small bowel follow-through. All patients had preoperative and postoperative symptom sheets in which 7 symptoms were scored for both severity and frequency on a scale of 0-4. The scores were analyzed using paired sample *t* test.

Results: This study included 58 patients with surgery for gastroparesis. Thirty-three had gastric stimulator (GES), 7 had pyloroplasty (PP), 16 had both gastric stimulator and pyloroplasty (GSP), and 2 had sleeve gastrectomy (SG). For patients in the GSP group, the second procedure was performed if there was inadequate improvement with the first procedure. There was no mortality. The follow-up period was 6-316 weeks (mean 66.107 ± 69.42). GES significantly improved frequency and severity for all symptoms except frequency of bloating and postprandial fullness. PP significantly improved severity of nausea and vomiting and frequency of nausea and early satiety. Symptom improvement for GSP was measured from after the first to after the second procedure. GSP significantly improved all but severity of vomiting and frequency of early satiety, postprandial fullness, and epigastric pain.

Conclusion: All procedures significantly improved symptoms, although numbers are small in the PP group. GES showed more improvement than PP, and if PP or GES does not adequately improve symptoms, GSP is appropriate. In our practice, gastrectomy was reserved as a last resort.

Table. Symptom Score Improvement Preoperatively Compared to Postoperatively for Frequency and Severity

	Symptom	Stimulator	Pyloroplasty	Combined
Severity	Vomiting	1.26 ± 1.5 ($P<0.0001$)*	1.75 ± 0.99 ($P=0.007$)*	0.59 ± 1.42 ($P=0.117$)
	Nausea	1.14 ± 1.15 ($P<0.0001$)*	1 ± 1 ($P=0.038$)*	1.28 ± 1.21 ($P=0.001$)*
	Early satiety	1 ± 1.38 ($P=0.0002$)*	0.64 ± 1.31 ($P=0.243$)	0.91 ± 1.0 ($P=0.003$)*
	Bloating	0.53 ± 1.39 ($P=0.041$)*	0.36 ± 0.63 ($P=0.182$)	1.38 ± 1.26 ($P=0.001$)*
	Postprandial fullness	0.91 ± 1.79 ($P=0.006$)*	0.21 ± 1.20 ($P=0.786$)	1.31 ± 1.08 ($P=0.0002$)*
	Epigastric pain	1.13 ± 1.48 ($P=0.0002$)*	0.67 ± 1.37 ($P=0.286$)	1.03 ± 1.09 ($P=0.002$)*
	Epigastric burning	0.9 ± 1.78 ($P=0.010$)*	1.14 ± 1.68 ($P=0.121$)	1.28 ± 1.39 ($P=0.002$)*
Frequency	Vomiting	1.10 ± 1.7 ($P=0.001$)*	0.57 ± 1 ($P=0.280$)	0.90 ± 0.70 ($P=0.030$)*
	Nausea	0.82 ± 1.48 ($P=0.004$)*	1.14 ± 0.90 ($P=0.015$)*	0.70 ± 1.16 ($P=0.035$)*
	Early satiety	0.74 ± 1.61 ($P=0.016$)*	0.86 ± 0.90 ($P=0.045$)*	0.07 ± 1.53 ($P=0.869$)
	Bloating	0.23 ± 1.65 ($P=0.451$)	0.79 ± 0.99 ($P=0.082$)	1.0 ± 1.65 ($P=0.034$)*
	Postprandial fullness	0.60 ± 1.91 ($P=0.092$)	0 ± 2.08 ($P=1.0$)	0.13 ± 1.64 ($P=0.758$)
	Epigastric pain	0.91 ± 1.53 ($P=0.002$)*	0.5 ± 1.38 ($P=0.415$)	0.40 ± 1.72 ($P=0.348$)
	Epigastric burning	0.92 ± 2.02 ($P=0.015$)*	0.43 ± 1.72 ($P=0.534$)	1.20 ± 1.47 ($P=0.007$)*

Reported as mean improvement in score ± standard deviation. **P* value <0.05 considered significant.

111 Is There a Correlation Between Increased Tumor Size and Biological Aggressiveness in ER-Positive, HER2-Negative, Lymph Node–Negative Breast Cancer?

Lauren Arthur, MD[1], Lauren Slattery, BS[1], George M. Fuhrman, MD[2], Aimee Mackey, MD[2], Amy Rivere, MD[2], Ralph Corsetti, MD[1,2]

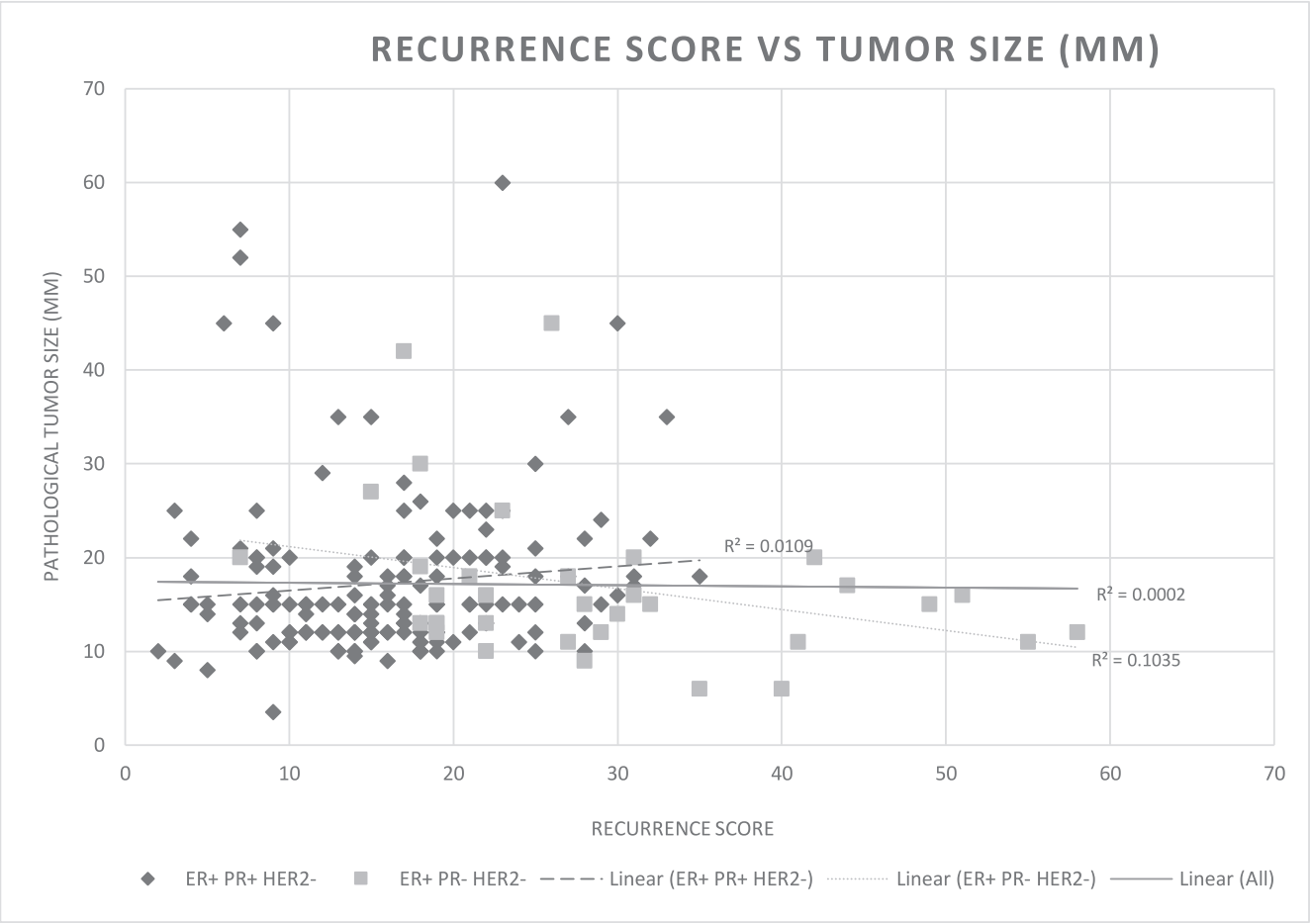
[1]*The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA* [2]Department of Surgery, Ochsner Clinic Foundation, New Orleans, LA

Background: Traditionally, larger size breast tumors have been thought to be more aggressive, which is reflected in standard TNM staging. Oncotype DX assay provides a recurrence score based on genomics that predicts the likelihood of distant recurrence in ER-positive, HER2-negative disease. This study used recurrence score and tumor size to determine if there was a correlation between tumor size and biologic aggressiveness. We hypothesized that large node-negative tumors may not be as biologically aggressive as smaller tumors with similar receptor and nodal status.

Methods: This was a retrospective review of breast cancer patients at Ochsner Clinic between 2007-2017 with Oncotype DX recurrence scores and ER-positive, HER2-negative, lymph node–negative tumors. Tumor size is reported as pathologic size in mm, and the receptor status is as reported from Oncotype DX assay. The tumor size was compared to the recurrence score in 2 separate groups: ER+/PR+/HER2- and ER+/PR-/HER2-.

Results: The data set included 191 tumors: 157 were ER+/PR+/HER2- and 34 were ER+/PR-/HER2-. There were 19 T1b, 135 T1c, 33 T2, and 3 T3 tumors (and 1 T1a lesion). Recurrence scores ranged from 2 to 58. The Figure shows that a larger tumor size was not associated with a higher recurrence score, and PR-negative receptor status was associated with a higher recurrence score.

Conclusion: Increasing tumor size may not be associated with increasing biologic aggressiveness as determined from Oncotype DX recurrence score. Therefore, we suggest all tumors meeting the ER-positive, HER2-negative criteria, regardless of size, be considered for genotyping. There is also a trend for higher recurrence score in the PR-negative tumors, demonstrating PR-negative receptor status as a predictor for higher risk of distant recurrence.



112 Complications After Endovascular Treatment of Hepatic Artery Stenosis Following Liver Transplantation

Leighton Goldsmith, MD[1], Kristy Wiebke, DO[1], John Seal, MD[2,3], Clayton Brinster, MD[1], Taylor A. Smith, MD[1,3], Hernan A. Bazan, MD[1,3], W. C. Sternbergh, MD[1,3]

[1]Department of Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]Multi-Organ Transplant Institute, Ochsner Clinic Foundation, New Orleans, LA [3]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Endovascular treatment of severe hepatic artery stenosis (HAS) after liver transplantation has emerged as the dominant method of treatment. However, complications of this therapy are poorly described.

Methods: A single-center, retrospective review of all patients undergoing angiography and possible intervention for HAS after liver transplantation between August 2009 and March 2016 was performed. Severe HAS was identified by routine duplex surveillance ultrasound (peak systolic velocity $>$400 cm/s, resistive index $<$0.5, and presence of tardus parvus waveforms).

Results: In 1,129 liver transplant recipients, 106 angiograms were performed in 79 patients (6.9%) for severe de novo or recurrent HAS. Interventions were performed in most of the cases (99/106, 93.4%), either with percutaneous transluminal angioplasty alone (34/99) or with stent placement (65/99). Immediate technical success was 91%. Major complications occurred in 8/106 (7.5%) cases, consisting of target vessel dissection (5/8) and rupture (3/8); successful acute endovascular treatment was possible in 6 of the 8 (75%) patients. No complication required open surgical intervention. With a median follow-up of 22 months, 4/8 (50%) patients with a major complication progressed to HAT compared to 1/71 (1.4%) in patients undergoing intervention without a major complication ($P<0.001$). One patient required retransplantation. Severe vessel tortuosity was present in 75% (6/8) of interventions with a major complication compared to 34.6% (34/98) in those without ($P=0.05$). In the complication cohort, 37.5% (3/8) of the patients had received a second liver transplant prior to intervention, compared with 12.6% (9/71) of the patients in the noncomplication cohort ($P=0.097$).

Conclusion: While endovascular treatment of HAS is safe and effective in most patients, target vessel injury is possible. Severe tortuosity of the hepatic artery or prior retransplantation was associated with a 2- to 3-fold increased risk of a major complication.

113 Laparoscopic Approach to Perforated Peptic Ulcers Trends Toward Quicker Recovery

Salim Hosein, MD[1], Jeffrey C. Lawrence, BA[2], George M. Fuhrman, MD[1], William S. Richardson, MD[1,2]

[1]Department of Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Laparoscopic management of perforated peptic ulcers (PPU) is an accepted approach in select patients. We aimed to identify the frequency with which this approach is utilized at Ochsner institutions and to assess for safety and outcomes compared to the open approach.

Methods: We performed a retrospective review of the electronic medical record from 2012-2016 of operatively managed cases of PPU identified by CPT codes. Nonperforated ulcers repaired electively or for bleeding were excluded. Data were analyzed in an intention-to-treat manner for demographic and outcome differences between the 2 groups.

Results: Seventy-three cases of PPU requiring emergent operative intervention were identified. Twelve (16%) were approached laparoscopically with successful completion in 84% and conversion to open in 2/12 (16%). Demographics other than preoperative morbidities did not statistically vary between groups. Length of stay (LOS) was significantly shorter in the laparoscopic group. Other outcomes were not significantly different. No laparoscopic patients had uncontrolled comorbidities vs 19 in the open group; however, when these cases were excluded, means for operating room time, days to liquids, and LOS were consistently lower for the laparoscopy group, although not statistically. There were no mortalities in the laparoscopic group and 12 in the open group. Laparoscopic approaches were pursued almost exclusively by known minimally invasive/bariatric surgeons, whereas general/acute care surgeons opted for an open approach.

Conclusion: In select patients, laparoscopic management of perforated peptic ulcers appears to be safe without added morbidity and may decrease LOS and time to resumption of liquids. In our experience, patient comorbidities and surgeon preference play a role in technique selection, but starting laparoscopically is an option worth considering in the appropriate clinical setting.

Table. Open vs Laparoscopic Surgery Outcomes

	Open	Laparoscopic	*P* Value
Length of stay	10.3 ± 8.9 (median 7)	6.0 ± 4.4 (median 5)	0.03
Exc preop comorbidity	-8.95 ± 7.3 (median 6.5)		
Days to liquids	5.1 ± 3.5 (median 4)	4.16 ± 4.6 (median 3)	0.11
Exc preop comorbidity	-4.72 ± 3.5 (median 4)		
Operating room time	67.6 ± 31.9	51.8 ± 18.7	0.10
Exc preop comorbidity	-70.8 ± 34.9		
Reoperate/drain	13.1%	16.7%	0.52
Mortality	21.3%	0.0%	0.11

114 Hypnosis Reduces Pain and Anxiety in Children With Acute Burn Injuries: A Randomized Controlled Trial

Stephen J. Chester, BA[1], Zephanie Tyack, PhD[2], Bronwyn Griffin, PhD[2], Alexandra De Young, PhD[2], Belinda Kipping, MPhil[2], Kellie Stockton, PhD[2], Roy M. Kimble, MD[2]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Center for Children's Burns & Trauma Research, Lady Cilento Children's Hospital, Brisbane, Australia

Background: Nonpharmacologic interventions are critical for pain and anxiety management in pediatric burns and are linked with improved healing rates. Although medical hypnosis (hypnotherapy) is effective for decreasing pain and anxiety in adult burns and during painful pediatric procedures, no randomized controlled trial (RCT) has investigated hypnotherapy for pediatric burns. This RCT aimed to determine if hypnotherapy decreases children's pain, anxiety, and stress during wound care procedures and accelerates wound healing.

Methods: Children (4-16 years) with acute burns presenting for their first dressing change were randomly assigned to either group 1, the experimental group (hypnotherapy), or group 2, the control group (standard care). Repeated measures of pain intensity, anxiety, stress, and wound healing were taken at every dressing change until ≥95% wound reepithelialization.

Results: Data for 62 children were analyzed on an intent-to-treat basis using generalized estimating equations (n=35 standard group, n=27 hypnotherapy group). The hypnotherapy group self-reported pain scores that were significantly lower on a 0-10 scale than the standard care group scores prior to dressing change number 2 (mean difference=-1.37; 95% confidence interval [CI] -2.61, -0.12; P=0.03) and number 3 (mean difference=-1.33; 95% CI -2.53, -0.13; P=0.03). Across all dressing changes, parent-reported maximum pain intensity scores for the hypnotherapy group were significantly lower (mean difference=-1.16; 95% CI -2.31, -0.01; P=0.048). Prior to the second dressing change, the hypnotherapy group also reported significantly lower anxiety scores (mean difference=-1.11; 95% CI -1.99, -0.22; P=0.01) on a visual analog scale compared to standard care. At the third dressing change, the hypnotherapy group had significantly lower heart rates (bpm) preprocedure (mean difference=-18.50; 95% CI -31.93, -5.07; P=0.01) and postprocedure (mean difference=-18.08; 95% CI -33.86, -2.30; P=0.03). No adverse events occurred in either group.

Conclusion: Hypnotherapy appears to be effective for decreasing pain, preprocedural anxiety, and stress during pediatric wound care procedures.

115 Five-Year Review of Post Left Ventricular Assist Device Outcomes in Relation to Body Mass Index

Sylvia M. Laudun, DNP, MBA, RN[1], P. Eugene Parrino, MD[1,2], Michael J. Bates, MD[1,2], Aditya Bansal, MD[1,2]

[1]Department of Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Assumption in the medical community is that patients with a higher body mass index (BMI) are at an increased risk for complications post device implantation. The purpose of this study was to analyze outcomes by grouping patients using BMI at a large quaternary care center.

Methods: Retrospective review was done utilizing the INTERMACS registry and the implanting institution's electronic medical record after obtaining institutional review board approval from October 2010-September 2016. Data abstraction was limited to implantation of primary left ventricular assist device (LVAD) in patients >18 years of age who completed 12 months of follow-up. A total of 182 primary implants were included for this study. Patients were grouped according to their preoperative BMI into 6 categories: underweight (BMI <18.5); normal weight (BMI 18.5-24.9); overweight (BMI 25.0-29.9); obese class 1 (BMI 30 -34.9); obese class 2 (BMI 35-39.9); and severe obesity class 3 (BMI ≥40).

Results: Normal weight patients (n=51) experienced the highest percentage of mortality at 27% (at 12 months) and neurologic events at 22%. Overweight patients (n=67) had the highest percentage of driveline infections at 12%. Obese class 2 patients (n=15) had the highest percentage of device malfunction at 40%. In our study, none of these findings achieved statistical significance (P<0.05). Patients across all BMIs had a weight increase of 10% to 22% by the 12-month follow-up postimplantation.

Conclusion: A common myth in the medical community about obesity was not validated in our experience. However, interesting findings from our study reveal a trend for increased device malfunction in obese individuals, and also that all groups of patients experienced weight gain after implantation. The drawbacks of this study include its retrospective nature, single center, and low volumes in the underweight and severe obesity group. Multiinstitutional studies are needed to address these important issues in the LVAD patient population.

116 Accuracy in Identification of Urgent and Emergent Urologic Conditions by Consulting Physicians

Grant R. Pollock[1], Danica May, MD[2,3], Dunia Khaled, MD[2,3], Amanda Saltzman, MD[4], Jeremy Konheim, MD[2], Raunak Patel, MD[2], Ashley Richman, MD[2,3], Samantha Prats, MD[2], Allison Feibus[1], William Chastant[1], Joseph Fougerousse[1], Brian Baksa[3], Melissa Montgomery, MD[2,3]

[1]Louisiana State University School of Medicine, New Orleans, LA [2]Department of Urology, Ochsner Clinic Foundation, New Orleans, LA [3]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [4]Department of Urology, Children's Hospital Colorado, Denver, CO

Background: Data regarding inpatient urologic consultation are limited. We sought to evaluate the accuracy of consulting physicians in identification of urologic diagnosis prior to consultation of the urology service. We placed special emphasis on urologic emergencies, including obstructing calculi requiring intervention, testicular torsion, and paraphimosis.

Methods: Between January 2013 and January 2015, 1,596 adult consults were retrospectively identified. Of these, the consulting physician entered a preconsult diagnosis in 1,561 cases. The charts were reviewed, and the congruency between urologic assessment and consultant's reason for consultation was assessed. Furthermore, we assessed the frequency with which consultants were able to differentiate obstructing vs nonobstructing and impact and intervention.

Results: Of the 1,561 cases with a preconsult diagnosis entered, the primary team was congruent in diagnosis on 1,056 (67.5%) of the cases and incongruent in 505 (32.5%) of the cases. Thirty-five (2.2%) cases had no reason noted. Paraphimosis was diagnosed correctly prior to consultation 7 of 12 times (58.3%). Recognition of nephrolithiasis prior to consultation occurred in 133 of 201 cases (65.7%). Of these, the providing teams identified a stone location or the used identifiers "obstructing" or "nonobstructing" in 69 cases (50.4%). Intervention was performed in 120 of the 201 stone cases, and 59 (49.1%) were congruent with the diagnosis. Testicular torsion was diagnosed correctly in 6 of 9 cases (66.7%).

Conclusion: The prompt identification of urgent and emergent urologic conditions by primary care and emergency providers is critical. The analysis of this data provides an improved understanding of the deficiencies that may translate into delayed intervention and poorer patient outcomes (namely missing the presence of paraphimosis, inability to identify nephrolithiasis requiring urgent intervention, or the inability to identify testicular torsion). With this knowledge, we hope to improve education and the timeliness and accuracy of diagnosis and improve patient care.

117 Transcatheter Aortic Valve Replacement for Aortic Regurgitation as a Bridge for Combined Liver and Kidney Transplantation

Loui Rejjal, MD[1], Ahmet Afsin Oktay, MD[2], Mohammad Iffat Kabir Anindo, MD[1], Natalie Bzowej, MD[3], Stephen Ramee, MD[2]

[1]Department of Internal Medicine, Ochsner Clinic Foundation, New Orleans, LA [2]Department of Cardiology, Ochsner Clinic Foundation, New Orleans, LA [3]Department of Gastroenterology and Hepatology, Ochsner Clinic Foundation, New Orleans, LA

Background: The long-term management of patients with coexistent severe aortic regurgitation (AR) and liver cirrhosis constitutes a real challenge because severe AR is a contraindication for solid organ transplantation, and liver cirrhosis conveys a high risk of mortality for surgical aortic valve (AV) replacement (AVR). Therefore, these patients are often declined for life-saving surgical treatment options.

Case Report: A 56-year-old female with a history of AR and liver cirrhosis secondary to nonalcoholic steatohepatitis presented to our center for liver transplant workup. The patient reported jaundice, abdominal distension, leg edema, and exertional dyspnea (NYHA class II). Her initial Model for End-Stage Liver Disease (MELD) score was 15, which later progressed to 21. During her evaluation, she developed acute hepatic decompensation and hepatorenal syndrome. Her 2-dimensional echocardiogram demonstrated degenerative severe regurgitation, mild stenosis of AV (AV area=1.8 cm^2), and moderately enlarged left ventricle with normal systolic function. She was declined for liver transplant due to her valvular heart disease. She was also deemed inoperable for surgical AVR due to her frailty (frailty index 4/4) and liver cirrhosis with high MELD score. The multidisciplinary care team agreed on pursuing transcatheter AVR (TAVR) for treatment of the AV disease. The workup included a diagnostic left heart catheterization demonstrating normal coronaries. Under deep sedation, the patient successfully underwent placement of a 29-mm self-expanding prosthesis with transfemoral access. No AR was observed on post-TAVR echocardiogram. She was subsequently listed for transplant. Six months later, she underwent combined orthotropic liver and kidney transplant from a cadaveric donor without any complications.

Conclusion: The TAVR is a revolutionary and safer option for inoperable or moderate to high-risk patients with native AV stenosis. Its use in AR has been described, although several limitations exist for this indication. Our case demonstrates a unique lifesaving role of TAVR beyond sole treatment of AV disease.

118 Autoimmune Diabetes Presented With Diabetic Ketoacidosis Induced by Immunotherapy in an Adult With Melanoma

Ahlam Alzenaidi, MD[1], Loui Rejjal, MD[1], Jared Dendy, MD[2]

[1]Department of Internal Medicine, Ochsner Clinic Foundation, New Orleans, LA [2]Department of Endocrinology, Ochsner Clinic Foundation, New Orleans, LA

Background: Immunotherapy has been approved for treatment of melanoma. Autoimmune endocrinopathies have been reported in trials involving immunotherapy, but autoimmune diabetes has not been definitively linked to immunotherapy. We describe a case of autoimmune diabetes presenting with diabetic ketoacidosis (DKA) after the patient received combined immunotherapy.

Case Report: A 47-year-old male with a history of metastatic melanoma and type II diabetes mellitus (DMII) presented to our institution with confusion, abdominal pain, and decreased oral intake. He reported a remote history of DMII treated with metformin that was discontinued 2 years ago. His symptoms started 8 days after receiving nivolumab/ipilimumab for his melanoma. Computed tomography (CT) scan of the head was negative for acute abnormalities or a brain mass. He was noticed to have hyponatremia (126 mmol/L), hyperkalemia (6.7 mmol/L), elevated creatinine (3.5), decreased bicarbonate (5 mm/L), hyperglycemia (985 mg/dL), elevated serum beta-hydroxybutyrate (4.7 mmol/L), elevated anion gap (43), and elevated lipase (535 u/L). The patient was treated for DKA with insulin and intravenous fluids. Given his history of metastatic melanoma, his DKA was initially thought to be secondary to pancreatic metastasis considering the elevated lipase level. A noncontrast CT of the abdomen showed no evidence of pancreatic metastasis. Further investigation identified high serum titers of antiglutamic acid decarboxylase (anti-GAD) antibodies (0.43 nmol/L, N: $<$0.02 nmol/L) and a low C-peptide level (0.2 ng/mL, N: 0.9-5.5 ng/mL); other islet autoantibodies were not elevated, and his hemoglobin A1C was 8.0%.

Conclusion: There are few case reports of diabetes caused by immunotherapy. Autoimmune mechanism was suggested as the culprit, although not all cases reported with positive antibodies. Moreover, it is unlikely that the patient developed latent autoimmune diabetes (LADA) that was not related to immunotherapy due to the fact that the course of LADA is qite more gradual and our patient presented with DKA a few days after the second cycle.

119 Immunoglobulin G4 Autoimmune Pancreatitis Masquerading as Pancreatic Adenocarcinoma

Muhammad F. Mubarak, MBBS[1], Abdul Mukhtadir Khan, MD[2], Arnab Ray, MD[3]

[1]Department of Internal Medicine, Ochsner Clinic Foundation, New Orleans, LA [2]Department of Pulmonary/Critical Care, Ochsner Clinic Foundation, New Orleans, LA [3]Department of Gastroenterology, Ochsner Clinic Foundation, New Orleans, LA

Background: Immunoglobulin G4 (IgG4)-related autoimmune pancreatitis (AIP) is an uncommon disease of the broader IgG4 autoimmune systemic disease. IgG4-related AIP can have significant radiologic and histologic resemblance to pancreatic cancer. Differentiating between IgG4-related AIP with tumor-like swelling and pancreatic cancer may be difficult and may lead to a mistaken diagnosis. Clinical suspicion is essential in recognizing this resemblance to avoid unnecessary medical treatment such as chemotherapy and surgery. We present a case of a 65-year-old female with IgG4-related AIP proven by histology and serology who initially received 4 cycles of chemotherapy for suspected well-differentiated pancreatic adenocarcinoma.

Case Report: A 65-year-old female presented to our clinic with intermittent abdominal discomfort that started following a car accident. The patient described a feeling of tightness and clenching in the epigastric area associated with eating. She also reported postprandial bloating and diarrhea after eating foods containing fat or protein. Physical examination was remarkable for tenderness in the periumbilical region and no organomegaly. Basic laboratory work was unremarkable. Further workup with esophagogastroduodenoscopy was unrevealing. Computed tomography scan of the abdomen revealed an 8 cm mass in the body and tail of the pancreas. Endoscopic ultrasound-guided (EUS) biopsy was suspicious for pancreatic adenocarcinoma. She underwent 4 cycles of FOLFIRINOX with no improvement. Repeat sampling through EUS revealed IgG4 mediated-disease of the pancreas that improved with steroids.

Conclusion: Idiopathic pancreatitis associated with hypergammaglobulinemia was first described in 1961. Currently, a separate entity of autoimmune disease called IgG4-related systemic disease (IgG4-RSD) has been linked to a previously unidentified disease process of multiorgan inflammation including the pancreas. Our case highlights the great resemblance between IgG4 disease of the pancreas and pancreatic adenocarcinoma. Failure of chemotherapy should raise clinical suspicion in which other disease process of pancreatic masses with IgG4 autoimmune disease should be considered.

120 Metastatic Renal Cell Carcinoma Presenting as a Bleeding Gastric Polyp

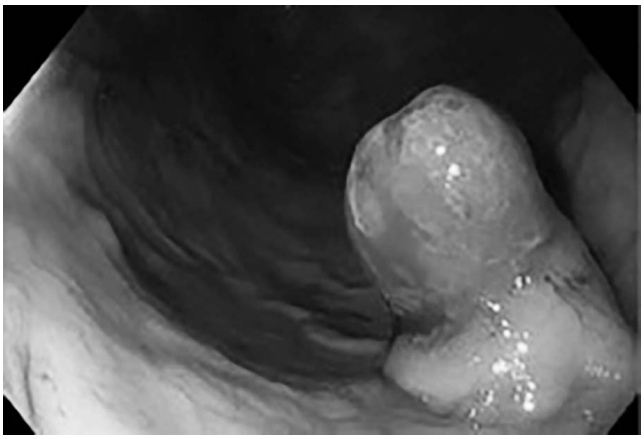
Muhammad F. Mubarak, MBBS[1], Ebubekir S. Daglilar, MD[2], Arnab Ray, MD[2]

[1]Department of Internal Medicine, Ochsner Clinic Foundation, New Orleans, LA [3]Department of Gastroenterology, Ochsner Clinic Foundation, New Orleans, LA

Background: Renal cell carcinoma (RCC) is known to cause widespread metastasis to multiple distant organs of the body including the gastrointestinal tract. We describe a case of gastrointestinal bleeding in an elderly female found to have a gastric polyp of RCC origin.

Case Report: An 83-year-old female presented with melenic stool and blood clots in her ostomy bag and blood-loss anemia. On physical examination, vital signs were remarkable for tachycardia and hypoxia; the patient was pale and generally ill-appearing; abdomen was nontender but notable for dark output in the ostomy bag. Her blood count was notable for hemoglobin of 7.0. Upper endoscopy was performed yielding a gastric polyp with active bleeding. Polypectomy was performed and sent for pathology. Histopathology and immunohistochemical staining were consistent with metastatic RCC (mRCC). Biopsy results were discussed with the patient's son and family. They were offered referral to oncology but refused due to multiple medical comorbidities and opted for hospice care.

Conclusion: Metastasis to the stomach is a rare clinical finding. It was found to represent 0.2%-0.7% of autopsy and clinical series. Organs serving as primary source of malignancy include breast cancer, lung cancer, RCC, and melanoma. Gastric metastasis was found in one review study to have an average age of presentation at 59.1 years with metastasis occurring 16-78 months since diagnosis of primary malignancy. This case highlights the propensity of mRCC to involve the stomach and cause blood-loss anemia. Gastric mRCC usually lags primary tumor growth by years and usually entails poor prognosis. This case also signifies the role of upper gastrointestinal (GI) endoscopy in diagnosing and treating metastatic causes of upper GI bleeding.



121 Donor Cell Myeloma

Alejandra del Toro, MD[1], Robert Emmons, MD[2,3]

[1]Department of Hematology/Oncology, Ochsner Clinic Foundation, New Orleans, LA [2]Department of Bone Marrow Transplantation, Ochsner Clinic Foundation, New Orleans, LA [3]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Allogeneic transplant has been a therapeutic option for various malignant disorders and poorly functioning bone marrow conditions. Because of significant transplant-related mortality, its role in treatment of multiple myeloma has been given less support. Other possible risks of hematologic stem cell transplant (HSCT) involve secondary malignancies. Malignancy originating from donor cells is a phenomenon increasingly studied in donor cell leukemia following HSCT. The bone marrow microenvironment has been postulated to play a role in carcinogenesis. We present a case of very rare donor cell myeloma in a patient who previously had multiple myeloma.

Case Report: A 49-year-old female was diagnosed with stage IIa multiple myeloma. Following treatment with chemotherapy, she opted for allogeneic transplant in view of her sister being a good match. Seventeen years after her transplant, the patient developed pancytopenia with a WBC of 2,980/mm^3, hemoglobin of 9.3 mg/dL, and platelet count of 79,000/mm^3. A bone marrow biopsy done December 2, 2013 showed 90% infiltration of her biopsy with plasma cells. Cytogenetics were 46,XX. To determine chimerism, buccal and peripheral blood samples were obtained from both patient and donor and evaluated at 15 DNA loci. Chimerism from the patient's bone marrow was 100% donor. Hence, the plasma cells that caused her myeloma came from donor cells. The patient's donor meanwhile has been free of disease. The patient received therapy for her new myeloma followed by a HSCT from a different sibling matched donor on July 1, 2015. She has been free of disease since.

Conclusion: This unique case exemplifies the curative potential of allogeneic HSCT for multiple myeloma. It also provides insight into the possible role that the bone marrow microenvironment plays in myeloma cell development.

122 Orbital Myositis Secondary to Cytotoxic T-Lymphocyte–Associated Protein 4 Antibody

Dipen C. Patel, MD[1], Alexander Tremont, MD[2], Jyotsna Fuloria, MD[1]

[1]Department of Hematology/Oncology, Ochsner Clinic Foundation, New Orleans, LA [2]Department of Internal Medicine, Ochsner Clinic Foundation, New Orleans, LA

Background: Ipilimumab is a monoclonal antibody used for treatment of metastatic melanoma. This report describes a patient with orbital myositis secondary to ipilimumab.

Case Report: A 39-year-old male was diagnosed with melanoma, BRAF wild type, of the left cheek, a stage T4aN1M0 lesion. He was started with ipilimumab at 10 mg/kg given every 21 days. He developed left-sided facial edema with diplopia 4 days after receiving his fourth treatment of ipilimumab. He complained of blurriness with distant vision and double vision and also had associated headache and dizziness. He was started on oral prednisone, 100 mg daily, when he presented with facial edema and diplopia and had some clinical improvement. Magnetic resonance imaging (MRI) brain scan was negative for metastasis. Slit lamp and fundus examinations were unremarkable. A week later, after being instructed to taper prednisone from 100 mg to 50 mg daily, symptoms worsened and prednisone dose had to be reescalated to 100 mg daily. Despite the escalated dose, he presented to the emergency department 10 days later for worsening symptoms with associated photophobia and tearing. Prednisone was increased to 125 mg by mouth daily. MRI with contrast at this time showed subtle heterogeneous edema and enhancement of the extraocular muscles bilaterally but most prominent on the left involving the superior and lateral rectus muscles. He was diagnosed with orbital myositis. He was discharged after some improvement but needed a readmission for worsening symptoms. Intravenous steroids were instituted. Intraocular pressure was noted to be elevated with tonometry, and the patient was started on timolol and brimonidine eye drops. Elevated intraocular pressure was thought to be secondary to steroid use.

Conclusion: This case is one of first few reports of orbital myositis as an adverse event related to anti-CTLA-4 treatment. Several dysimmune toxicities have been observed, with ophthalmic toxicity less common. Orbital myositis has unique presentation and should be identified early along with administration of high-dose steroids to improve symptoms.

123 Novel Association of Mesangial IgM Deposits With Rapidly Progressive Diabetic Nephropathy

Bronwyn LeBlanc, MD[1], Juan Carlos Q. Velez, MD[1,2], Ivo Lukitsch, MD[1,2]

[1]Department of Nephrology, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Classic diabetic nephropathy (DN) is characterized by progressive proteinuria and a decline in kidney function over a period of 10-15 years. However, when the clinical course does not fit the norm, a kidney biopsy is often performed to confirm the diagnosis. Whether the tissue specimens of patients who require kidney biopsy and are found to have DN disclose additional unique pathologic findings is not well established.

Methods: We performed a retrospective review of patients with long-standing type 2 diabetes mellitus who underwent kidney biopsy for the following indications: rapid onset or worsening of proteinuria uncharacteristic for DN (n=4) and positive serum protein electrophoresis for monoclonal gammopathy (n=3) suspicious for plasma dyscrasia. We excluded those without pathologic evidence of DN (n=1).

Results: Seven cases were identified. The mean age of the cohort was 61 years, predominantly female (57%) and black (57%). The mean serum creatinine, estimated glomerular filtration rate, and urine protein-to-creatinine ratio values at the time of the biopsy were 2.0 mg/dL, 35.8 mL/min, and 9.3 g/g, respectively. Glomerular findings consistent with DN and arterionephrosclerosis were present in all cases. In addition, varying degrees of mesangiopathic changes along with immunoglobulin M (IgM) deposition were noted. Four patients had a benign course with stable kidney function and normal progression of disease. However, 3 patients had a rapidly progressive course and required renal replacement therapy within 1 year after the biopsy.

Conclusion: Although IgM mesangial deposition is often associated with minimal change disease or focal segmental glomerulosclerosis, evidence of its association with DN is sparse. Furthermore, mesangial IgM deposition may be found in individuals with DN exhibiting an unusual clinical course, and this finding could be associated with an accelerated course of DN. Further investigation is warranted to better characterize this entity.

124 Cytomegalovirus-Associated Collapsing Glomerulopathy and Tubulointerstitial Nephritis in a Patient With T Cell Lymphoma Treated With Alemtuzumab

Edgar Hernandez Montalvo, MD[1], Sixto Giusti, MD[2,3], **Deepa Nagaraja, MBBS[1],** Agnes Fogo, MD[4], Juan Carlos Q. Velez, MD[1,3]

[1]Department of Nephrology, Ochsner Clinic Foundation, New Orleans, LA [2]Multi-Organ Transplant Institute, Ochsner Clinic Foundation, New Orleans, LA [3]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [4]Department of Pathology, Vanderbilt University Medical Center, Nashville, TN

Background: Collapsing glomerulopathy may occur as an idiopathic form or in association with a wide spectrum of viral infections and medications. Rare reports have linked cytomegalovirus (CMV) infection with collapsing glomerulopathy.

Case Report: A 69-year-old female with T cell lymphoma presented with decreased appetite and altered mental status. Her treatment for T cell lymphoma consisted of alemtuzumab after the patient had previously failed treatment with conventional chemotherapy. Laboratory data revealed pancytopenia and acute kidney injury (AKI) with serum creatinine of 2.6 mg/dL. Urinalysis was positive for protein (3+) and blood (3+). Urine microscopy demonstrated 1 red blood cell (RBC)/hpf, muddy brown casts, no RBC casts, and no dysmorphic RBCs. A urine protein-to-creatinine ratio revealed 24.8 g/g. A renal ultrasound revealed normal sized kidneys with hyperechoic parenchymal echotexture. Twenty-four hours after admission, the patient developed fever and hypotension requiring intravenous fluids, vancomycin, and cefepime. A search for a site of infection proved unsuccessful, with negative blood and urine cultures. Hemodialysis was initiated on hospital day 10 for progressive AKI with volume overload. Antinuclear antibody, human immunodeficiency virus (HIV) antibodies, polymerase chain reaction (PCR) for HIV RNA, hepatitis C antibodies, complement levels, hepatitis B antigen, and antibodies were all negative or normal. Acute CMV infection was subsequently diagnosed based on the detection of serum CMV DNA PCR of 3,450,814 copies/mL. A kidney biopsy was performed. The specimen showed parenchymal CMV^{+} antigen staining, diffuse tubulointerstitial nephritis, and collapsing focal segmental glomerulosclerosis. After initiation of treatment with ganciclovir and valganciclovir, the patient temporarily improved and stopped requiring hemodialysis. However, she subsequently deteriorated and was placed on permanent hemodialysis 3 months later.

Conclusion: CMV-associated glomerular involvement should be suspected in an immunocompromised host presenting with massive proteinuria and AKI. Prompt identification and institution of therapy could foster better outcomes.

125 An Atypical Presentation of Neuromyelitis Optica

Andrew Kolomensky, BS[1], Rinu Manacheril, MD[2]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Department of Neurology, Ochsner Medical Center, New Orleans, LA

Background: Neuromyelitis optica (NMO) is a rare, immune-mediated demyelinating disorder of the central nervous system, relapsing-remitting in nature that classically presents with optic neuritis and transverse myelitis.

Case Report: A 20-year-old female was admitted for evaluation of a 7-week history of altered mental status and fever. Seven weeks prior to presentation, she had flu-like symptoms treated with antibiotics. A week later, she presented to an outside emergency department complaining of bilateral flank pain, stiff neck, and fever; she was given antibiotics and discharged. Despite treatment, low-grade fevers persisted, and declining mental status and decreased visual acuity were noted, prompting her to seek treatment at a community hospital. Infectious and neurologic workup were remarkable for lymphocytic-predominant pleocytosis and elevated protein in CSF, positive Rocky Mountain spotted fever immunoglobulin G, and a hypothalamic lesion on magnetic resonance imaging (MRI). Doxycycline was commenced without improvement in mental status, at which point the patient was referred to our facility. Repeat MRI was remarkable for diffusion-weighted abnormality, T2/FLAIR hyperintensity demonstrating extensive white matter involvement. Spine imaging was unremarkable. In the absence of active infectious process with evidence of hypothalamic involvement, fevers were determined to be neurogenic. Repeat lumbar puncture was obtained, and empiric treatment with methylprednisolone was initiated with minimal improvement in cognition. When CSF analysis revealed positive titers for aquaporin-4 antibody, suggestive of NMO, she underwent therapy with plasma exchange and rituximab with significant neurologic improvement.

Conclusion: This case is of particular interest because of the rarity of the disease process, age at presentation, and insidious onset of symptoms in an otherwise healthy individual. In this patient, the time from initial presentation to diagnosis was $>$2 months, suggesting NMO poses a particular diagnostic challenge. An awareness of NMO spectrum disorders is necessary, and a higher index of suspicion should exist in patients with atypical neurologic symptoms in a clinical context suggestive of a demyelinating process.

126 Neuroleptic Use in a Multiple Sclerosis Patient With Parkinsonian Features

Elizabeth D. Verter, BA[1], David Houghton, MD, MPH[1,2], Bridget Bagert, MD, MPH[1,2]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Department of Neurology, Ochsner Clinic Foundation, New Orleans, LA

Background: We describe a case of an initial multiple sclerosis (MS) presentation characterized by profound asymmetric parkinsonism.

Case Report: A 43-year-old man presented to our MS center 1 month after acute onset of double vision and gait disturbance. Initial magnetic resonance imaging (MRI) of the brain revealed extensive periventricular white matter lesions typical of MS, including one large enhancing lesion in the substantia nigra pars compacta of the left midbrain. Cerebrospinal fluid showed 8 oligoclonal bands. Neurologic examination revealed right internuclear ophthalmoplegia, resting tremor of the right hand, bradykinesia, and postural instability. The patient had a 16-year history of schizophrenia managed chronically with risperidone and aripiprazole. He endorsed a mild tremor for many years that had only become severe during the preceding year. The patient was diagnosed with MS, started on natalizumab, and referred to a movement disorder specialist who recommended tapering of neuroleptics as tolerated. Aripiprazole was discontinued, and the patient's generalized bradykinesia and rigidity improved, but he developed psychosis soon thereafter and aripiprazole was restarted. DaTSCAN was ordered but was not approved by the patient's insurance company. Six months after initiation of natalizumab, repeat brain MRI revealed improvement in the appearance of the left midbrain lesion. Clinically, the patient's gait improved, but his right hand tremor, bradykinesia, rigidity, and postural instability did not change.

Conclusion: We postulate that this patient has had longstanding drug-induced parkinsonism from chronic neuroleptic use and that he further developed markedly asymmetric parkinsonism from the demyelinating lesion that formed in the contralateral substantia nigra pars compacta. Demyelinating lesions of the midbrain are common in MS, but such lesions do not commonly cause such disabling parkinsonism as observed in this patient. We suspect that his long-term use of high-dose neuroleptics may have potentiated the development of a uniquely parkinsonian phenotype from an otherwise typical midbrain MS lesion.

127 New Daily Persistent Headache Following Treatment With Tbo-Filgrastim

Fawad Khan, MD[1,2], Yuang Wen, BS[2]

[1]Department of Neurology, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Recombinant human granulocyte colony-stimulating factors (G-CSF) have been used in neutropenic patients to reduce the duration and degree of neutropenia and to decrease infectious complications. Transient headache is a known adverse effect that occurs in $<$8% of individuals who receive tbo-filgrastim (Granix), a short-acting recombinant form of G-CSF.

Case Report: A 44-year-old Caucasian female with a history of liver and kidney transplant on chronic immunosuppressant therapy received a 4-day course of tbo-filgrastim therapy for severe neutropenia associated with profuse diarrhea. On presentation, her white blood count was 1.93 K/uL, red blood cell count was 3.09 M/uL, and platelet count was 139 K/uL. On day 2 of the therapy, the patient experienced severe headache, nausea/vomiting, and back pain. Her blood counts improved dramatically within 48 hours of completion of the therapy. The back pain resolved but the throbbing headache persisted. On a follow-up visit at 17 weeks, her physical examination and fundoscopy were normal. She reported an overall improvement in headache beginning 13 weeks after the onset. She reported partial relief with caffeine and daily gabapentin. This patient's clinical presentation was consistent with a diagnosis of new daily persistent headache. She had no clinical features suggestive of another primary or secondary headache. A diagnostic workup to rule out intracranial etiologies was pended because of clinical improvement.

Conclusion: To our knowledge, this is the first reported case of tbo-filgrastim-related persistent headaches. On review of the literature, the 2 most common side effects are bone pain and headache that occur during the course of the therapy. Our patient developed persistent headaches that gradually improved, suggesting a prolonged effect of the tbo-filgrastim. We speculate that the history of liver and kidney transplant contributed to extension of the half-life and side effects of tbo-filgrastim.

128 Progressive Multifocal Leukoencephalopathy as the Initial Presentation for Human Immunodeficiency Virus Infection: A Case Report

Tara von Kleist, MD[1], Jose Posas, MD[1,2]

[1]Department of Neurology, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Progressive multifocal leukoencephalopathy (PML) is a devastating disease that causes severe neurologic deficits and is often fatal. PML occurs predominantly in immunocompromised patients, specifically in association with HIV infection, and typically requires severe immunosuppression with CD4 T-cell counts of $<$200 mm^3. In patients who are thought to be immunocompetent, diagnosis can be delayed as symptoms may be mistaken for a stroke or tumor. We report the case of a patient who was diagnosed with PML as the presenting illness for HIV.

Case Report: A 50-year-old male presented with progressive visual loss and memory impairment during the course of 1 month. Initial neuroimaging with magnetic resonance imaging (MRI) showed bilateral FLAIR hyperintensities predominantly in the left occipital lobe, and he was diagnosed with a subacute stroke. His symptoms continued to evolve, and he developed left hemiparesis, aphasia, and cognitive and behavioral issues. Further workup found he was HIV positive with JC virus in his cerebrospinal fluid. He was diagnosed with PML and started on antiretroviral therapy; however, his disease progressed with evolving lesions on MRI due to immune reconstitution inflammatory syndrome. He continued to decline despite steroid treatment, and he died 4 months after initial presentation.

Conclusion: This case highlights the importance of considering stroke mimics during workup and demonstrates the potential for misdiagnosis of PML when the patient is assumed to be immunocompetent. It also shows the need for careful follow-up and further testing when symptoms and clinical course do not correspond with the given diagnosis.

129 Lower Back Pain With a Rare Culprit: A Large, Insidiously Growing, Posterior, Lumbar Subcutaneous Arteriovenous Malformation

Samita S. Das, MD, MBA[1], Maged Guirguis, MD[1,2]

[1]Department of Anesthesiology, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Arteriovenous malformations (AVMs) are rare, high-flow lesions of the circulatory system with a direct connection between an artery and vein bypassing the capillary bed. AVMs can develop in any organ or system. A high-flow, complex AVM can increase cardiac output and ultimately result in congestive heart failure. Diagnosis is confirmed by ultrasound and Doppler examination, with magnetic resonance imaging (MRI) best elucidating the extent of vascular malformation. Angiography can demonstrate the anatomy of feeding and draining vessels, tortuosity, arteriovenous shunting, and drainage. Treatment includes embolization, sclerotherapy, surgical resection, and reconstruction.

Case Report: A 36-year-old female had a 5-year history of intermittent lower back pain associated with a slow-growing, subcutaneous, reddish lumbar swelling. She denied LE weakness, bowel/bladder dysfunction, or gait imbalance. Over time, the patient reported new-onset right-sided radicular pain. Physical examination revealed a mid-lumbar 3 $\times$ 3-cm soft tissue swelling with overlying petechiae and an overlying bruit. Computed tomography angiography demonstrated a lower lumbar subcutaneous high-flow, 4-cm nidus AVM with multilevel intercostal and lumbar arterial feeders from T9-L5 with a large superiorly coursing draining vein at T10. There was no direct involvement of the spinal canal. The patient was referred to radiation oncology for radiotherapy and embolization.

Conclusion: Congenital AVMs represent a failure of the embryonic vascular plexus to fully differentiate and develop into a mature capillary bed in between the arterial and venous circulation. The clinical picture can range from an asymptomatic birthmark to life-threatening congestive heart failure. Treatment should be targeted toward intractable symptoms or impending complications and include surgical resection and endovascular embolization. As rapid hemodynamic changes may be associated with arterial embolization, intraoperative monitoring should include invasive systemic and pulmonary pressure monitoring. If left untreated, arteriovenous shunting may lead to tissue ischemia and ulceration, persistent pain, hemorrhage, and high-output heart failure.

130 Reconstruction of a Surgically Absent Coronary Sinus During Heart Transplantation

Genevieve A. Hayek, MD[1], Michael J. Bates, MD[1,2], Aditya Bansal, MD[1,2], Matthew A. Gaudet, MD[1,2], P. Eugene Parrino, MD[1,2]

[1]Department of Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Unreconstructed surgical injury to the coronary sinus is almost always fatal. This case study examines the operative treatment of a 21-year-old patient with familial dilated cardiomyopathy and end-stage renal disease.

Case Report: The patient initially presented to our institution in cardiogenic shock refractory to medical management, requiring biventricular extracorporeal (CentriMag) support and renal replacement therapy. He underwent heart transplant on hospital day 50 with plans for a kidney transplant the next day. During dissection of the native heart, the patient was noted to have a persistent left superior vena cava (SVC), which was preserved with the native coronary sinus for length. During the back table process, it was discovered that the donor heart was missing a complete 2-cm segment of the coronary sinus due to iatrogenic injury sustained in procurement. The proximal and distal ends of the coronary sinus were identified, and it was determined that reconstruction of the coronary sinus was the only viable option. A 6-mm Gore-Tex ring graft was cut to size and secured to each end with a running 5-0 PROLENE suture. Later, the persistent left SVC was reimplanted into the right atrium.

Conclusion: The patient was able to separate from bypass easily without any evidence of venous congestion in the donor heart. He was able to undergo kidney transplant the next day and was extubated shortly thereafter.

131 Nodular Fasciitis in the Pediatric Population: A Case Report and Review of Pediatric Facial Masses

Hannah Z. Kooperkamp, MD[1], Jessica Roybal, MD[1,2]

[1]Department of Surgery, Ochsner Clinic Foundation, New Orleans, LA [2]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Nodular fasciitis is an uncommon benign soft-tissue tumor. The diagnosis is usually made postoperatively, as imaging characteristics are inconsistent and biopsies are unreliable. We present a case of nodular fasciitis of the head in a child, review the differential diagnosis of soft-tissue tumors of the face in the pediatric population, and discuss the workup and management of these lesions.

Case Report: An 8-year-old male presented to the pediatric surgery clinic with a growing mass at the medial aspect of his right eyebrow. The mass had initially grown quickly, and he developed telangiectasia of the overlying skin. The patient denied any history of trauma to the area. It was soft and mobile and nontender. Ultrasound showed a 2-cm mass that did not appear to penetrate the skull and had vascular flow. At surgery, a friable, unencapsulated mass was excised. The patient tolerated the procedure well and has excellent cosmesis. The pathology returned as nodular fasciitis with typical plump spindle cells and stains positive for smooth muscle actin and negative for S100, desmin, and CD34.

Conclusion: The differential diagnosis for soft tissue-tumors of the face in pediatrics includes more benign entities, such as epidermoid cysts, nerve sheath tumors, hemangiomas, and salivary gland tumors to rhabdomyosarcomas. The workup for pediatric soft-tissue masses of the face is not straightforward. Imaging with magnetic resonance imaging, computed tomography, and ultrasound as part of the diagnostic algorithm for soft-tissue tumors has been described. There is conflicting evidence on the value of fine needle aspiration and intraoperative frozen sections. Given the inconsistency in both fine needle aspiration results and frozen section, as well as the interest of minimizing unnecessary deformity to the face, it is reasonable to proceed with surgery without an extensive workup.

132 Skeletal Destruction: A Case Report of a Rare Presentation of Primary Hyperparathyroidism

Jeffrey C. Lawrence, BA[1], Jessica Pries, MD[2], Ralph Corsetti, MD[1,2]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Department of Surgery, Ochsner Clinic Foundation, New Orleans, LA

Background: We present an interesting case of a patient who presented with a large uterine mass suspicious for malignancy with concomitant bony lesions throughout her axial and appendicular skeleton.

Case Report: A 52-year-old Vietnamese female presented for evaluation of a large pelvic mass ($16 \times 14 \times 12$ cm) with lytic osseous lesions involving the ribs, pelvis, and bilateral femurs concerning for metastases (Figure). Computed tomography (CT) imaging revealed a 14-mm abnormality in the distal pancreas. The patient's history was significant for multiple primary relatives with hyperparathyroidism requiring surgery. Based on her initial presentation, there was concern for metastases from her pelvic mass. The patient underwent intramedullary nailing of her bilateral femurs and open biopsy, which was confirmed as a benign brown tumor. Based on these findings, and correlating the patient's family history of hyperparathyroidism to her presentation, multiple endocrine neoplasia type 1 (MEN-1) was suspected. The patient underwent a subtotal parathyroidectomy that was positive for parathyroid hyperplasia. Once stable from hungry bone syndrome, she underwent a total abdominal hysterectomy with bilateral salpingo-oophorectomy and a distal pancreatectomy with splenectomy. Final pathology on the pancreatic and uterine masses was confirmed as a benign pancreatic pseudocyst and a leiomyoma, respectively.

Conclusion: Prompt operative skeletal biopsy of the suspicious lesions was crucial in ruling out metastatic disease. Genetic testing for MEN-1 was not necessary in the acute management of this patient. It is critical to delineate benign pathology from potential lytic, bony, metastatic lesions in a patient presenting with this clinical picture and imaging.

133 Novel Chest Wall Reconstruction Following Excision of Xiphisternal Chondrosarcoma

Miranda Hann, BA[1], Brian Pettiford, MD[2], Christopher Babycos, MD[1,2]

[1]The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA [2]Department of Surgery, Ochsner Clinic Foundation, New Orleans, LA

Background: The most common primary malignant tumor of the chest wall is chondrosarcoma, which most frequently arises from the sternum. There have been limited reported cases of tumor origination from the xiphoid process. Patients present complaining of a large chest wall mass associated with pain and respiratory symptoms. These tumors are best managed by en bloc resection and chest wall reconstruction.

Case Report: A 49-year-old male presented with a large, painful chest wall mass associated with shortness of breath and exertional chest pressure. Computed tomography scan demonstrated a large mass arising from the xiphoid process; biopsy confirmed a grade 1 chondrosarcoma. The mass was removed en bloc and repaired with an innovative technique using omentum and PROCEED hernia prolene mesh. The final wound was closed with a fasciocutaneous flap.

Conclusion: To our knowledge, this is the first reported case of radial growth in a chondrosarcoma arising from the xiphoid process. Due to removal of the anterior pericardium and internal mammary arteries bilaterally, traditional reconstruction techniques were not applicable. Prolene mesh placement and omental transfer were used to provide coverage over the exposed mediastinal structures. The patient has recovered remarkably well, supporting the use of this technique in similar case presentations or resource-limited healthcare centers.