

**OCHSNER'S THIRTEENTH ANNUAL
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Translational Abstracts	1-28
Clinical Abstracts	29-107
Case Reports	108-134

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. Two abstracts were not presented at the event, so this compilation does not include abstracts 20 and 101.

1 Evaluating the Effects of Opioids on Tumor Growth and Metastases Using an Orthotopic Mouse Model

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Background: The effects of opioids on solid tumors are unknown. In animal models, studies show both positive and negative effects on tumorigenicity. Human studies have shown favorable outcomes in breast and prostate cancer patients when opioid use is reduced. The relationship between opioids and colon cancer is controversial, with no definitive influence on outcomes. We sought to investigate the relationship between opioid administration and human colon cancer growth using an orthotopic mouse model.

Methods: Luciferase-tagged HT-29 colon cancer cells and lymph node stromal cells (to enhance tumor growth) were injected into the rectal submucosa of 12 NOD/SCID mice. ALZET mini osmotic pumps were implanted in the subcutaneous tissue of 8 mice. These provided a set dose of morphine (50-100 mg/day, 70-kg patient equivalence) over a 14-day period. See table for groups. Bioluminescent imaging (BLI) was used weekly to monitor for tumor growth/metastases.

Results: Upon necropsy, average tumor weight was 0.31 g for group 1 and 0.62 g for group 2 ($P=0.04$). Average tumor BLI was $1.04E+11$ for group 1 and $9.64E+10$ for group 2 ($P=0.83$). All mice had lung metastases, and 50% of group 2 mice had liver metastases (based on $BLI > 10^6$).

Conclusion: The administration of morphine promotes colon cancer growth (based on weight) and metastases (based on BLI). Opioid use should be reduced in the perioperative period as much as tolerated to improve overall survival in colon cancer. Further experiments are needed to power our results. More physiologic doses and different types of opioids should be tested to approximate human models. The interaction between opioids and colon cancer should be further investigated on a molecular level, with special attention given to inhibiting their tumorigenic effects.

Table.

Groups	HT-29-Luc Cells	HK Cells	Morphine Pump	Tumor Weight (g)	Tumor BLI (Photons)	Liver Metastases	Lung Metastases
1	1×10^4	3×10^5	No	0.31 ± 0.14	$1.04E+11$	1/4 (25%)	4/4 (100%)
2	1×10^4	3×10^5	Yes	0.62 ± 0.31	$9.64E+10$	4/8 (50%)	8/8 (100%)

2 Analyze the Cytokine Profile Enriched in Microvesicles Derived from Lymph Node Stromal Cells in Colon Rectal Carcinoma

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Background: Microvesicles (MVs) are small membrane-enclosed sacs that are shed from a variety of cells and contain nucleic acids and soluble and transmembrane proteins. There is growing evidence that the lymph node (LN) microenvironment plays a significant role in colorectal cancer (CRC) cell progression. Our previous results have shown that lymph node stromal cells (LNSCs) support CRC cell progression *in vivo* and tumor growth *in vitro* that are largely dependent on LNSC-derived soluble factors. Here we further identify the key cytokines enriched in LNSC-derived MVs and their role in CRC growth and metastasis.

Methods: LNSCs were isolated from 88 CRC patients' mesentery LNs from the Department of Colon and Rectal Surgery. MVs from stromal cell line HK or LNSCs were isolated by ultracentrifugation and utilized for tumor growth assay *in vitro* and *in vivo*. Luciferase-tagged CRC cell line HT-29 cells were used for our study. HT-29Luc cells were injected into the rectum submucosa of NOD/SCID mice in our unique orthotopic CRC model in the absence or presence of HK cells/LNSCs or MVs derived from HK cells/LNSCs. Tumor growth and metastasis were detected by the In Vivo Imaging System. The cytokine expression profile in stromal cell supernatant and MVs was conducted using human cytokine array and compared statistically.

Results: Supernatant and MVs derived from LNSCs promote CRC cell line (HT-29) growth in a dose-dependent manner *in vitro*. MVs promote HT-29Luc cell tumorigenesis and distant organ metastasis *in vivo*. Human cytokine array revealed that 4 cytokines (SDF-1, IL-8, IFN- γ , and MIP-1 α) are significantly enriched in LNSC-derived MVs.

Conclusion: We have identified 4 cytokines that are enriched in MVs and that may act as an active intercellular communication pathway between LNSCs and CRC cells. This knowledge could lead to the development of select biomarkers for CRC metastasis and effective targeted therapies.

3 Increased Surface Expression of Inhibitory Molecules Correlates With Decreased Cytotoxic T Cell-Mediated Lysis

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Background: CD8⁺ T cells, or cytotoxic T lymphocytes (CTLs), critically recognize and directly destroy malignant cells. In melanoma, tumor cells can exhibit an early stress-induced drug-tolerant state following hypoxia or drug exposure that leads to treatment resistance. In this state, which is characterized by the expression of CD271, melanoma antigens like Melan-A and tyrosinase are downregulated. This may enable drug-tolerant cells to evade CTL-mediated lysis, which could explain melanoma survival during and disease relapse following treatment. This study investigated whether the initiation of a stress-induced drug-tolerant state in melanoma substantially impacts killing by melanoma-specific CTLs.

Methods: Human melanoma cell lines WM164 and WM35 were stressed with hypoxia or the chemotherapy drug docetaxel for 12 days, and CD271 expression was investigated by flow cytometry. To investigate changes in CTL killing ability, murine B16 melanoma cells were stressed with hypoxia or docetaxel, washed, dye labeled, and cocultured with tyrosinase-related protein 2 (TRP-2)-specific transgenic CTL cells. The level of tumor lysis in dye-labeled populations was assessed by flow cytometry following the addition of 7-AAD viability staining solution.

Results: Expression of CD271 on human melanoma cells was confirmed to be significantly upregulated under hypoxic conditions or docetaxel treatment. The lysis of stressed B16 melanoma cells by TRP-2 transgenic CTLs was markedly reduced by 40.9% or 39.4% following exposure to hypoxia or docetaxel, respectively.

Conclusion: Stressed human melanoma cells upregulate inhibitory molecules, such as CD271, and stressed murine melanoma cells show a marked increase in resistance to CTL killing. To determine clinical relevance, key experiments are now underway investigating inhibitory marker expression in patient biopsies pretreatment and posttreatment at early time points in those receiving either targeted therapies (dabrafenib/trametinib) or immunotherapies (nivolumab). Furthermore, the impact of targeted therapies on CTL killing of xenografted patient tumors will be determined.

4 Increasing Azole and Echinocandin Multidrug Resistance in *Candida glabrata*

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Background: We noticed increased reporting of multidrug-resistant (MDR) *Candida glabrata* from clinical isolates. These resistant isolates may limit treatment options in immunocompromised patients. Our objective was to evaluate the prevalence of MDR *C glabrata* strains among isolates submitted to our reference laboratory for susceptibility testing from institutions across the United States.

Methods: One hundred forty-two *C glabrata* clinical isolates submitted to the fungus testing laboratory between 2008 and 2014 were used. Minimum inhibitory concentrations (MICs) for fluconazole (FLU), voriconazole (VOR), and micafungin (MFG) were determined according to the Clinical and Laboratory Standards Institute (CLSI) M27-A3 standard. Isolates were classified as resistant to FLU (≥ 64 $\mu\text{g/mL}$) and MFG (≥ 0.25 $\mu\text{g/mL}$) based on the CLSI clinical breakpoints and resistance to VOR using the epidemiologic cutoff value (≥ 1 $\mu\text{g/mL}$). Differences in the numbers of isolates that were susceptible or resistant to MFG and that were also resistant to FLU and/or VOR were assessed for significance by Fisher exact test.

Results: A significant number of *C glabrata* isolates that were resistant to MFG were also resistant to FLU (40%) when compared to isolates that were susceptible or intermediate to MFG MICs (≤ 0.03 - 0.12 $\mu\text{g/mL}$, 20.5%, $P=0.03$). Moreover, significantly more isolates that were resistant to MFG were also resistant to VOR (56.7%) when compared to those with lower MFG MIC values (28.6%, $P=0.0085$). Results were supported by geometric mean MIC values that were higher for FLU and VOR against the isolates that were resistant to MFG (19.25 $\mu\text{g/mL}$ and 0.7014 $\mu\text{g/mL}$, respectively) when compared to isolates that were susceptible or intermediate to echinocandin (6.246 $\mu\text{g/mL}$ and 0.1845 $\mu\text{g/mL}$, respectively; $P<0.05$ for both comparisons).

Conclusion: These data clearly indicate that MFG resistance in *C glabrata* is associated with resistance to FLU and/or VOR. Future studies will determine if there is an underlying common resistance mechanism.

5 Synergy of Tigecycline Plus Fluconazole Against *Candida glabrata*

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Background: *Candida glabrata* is an important pathogen whose resistance to fluconazole and also echinocandins is a growing problem. Synergy of doxycycline plus fluconazole against *Candida albicans* has been described. We showed *in vitro* synergy with doxycycline plus fluconazole in 5/20 *C glabrata* blood isolates. Tigecycline is a synthetic tetracycline (glycylcycline) less susceptible to known tetracycline resistance mechanisms. We studied our same 20 blood isolates of *C glabrata* for evidence of *in vitro* synergy of tigecycline plus fluconazole using an Etest method.

Methods: The *C glabrata* isolates were collected from unique Ochsner Medical Center patients from 2009-2011. Isolates were identified with the API 20C yeast system and genetically fingerprinted by rep-PCR. A minimum inhibitory concentration (MIC):MIC Etest synergy method was used for synergy testing. All tests were done in triplicate (mean value used) and read at 24 h. A summation fractional inhibitory concentration (Σ FIC) was calculated for each isolate: synergy ≤ 0.5 ; additivity $>0.5-1$; indifference $>1-4$; antagonism >4 .

Results: Ten of the 20 isolates were susceptible, dose dependent, to fluconazole at 24 h with Etest MICs ≤ 32 $\mu\text{g/mL}$; the remainder were resistant (MICs 48 to >256 $\mu\text{g/mL}$). All isolates had tigecycline MICs >256 $\mu\text{g/mL}$. We detected synergy (Σ FICs 0.001-0.45) in 17/20 (85%) isolates. One isolate each showed additivity (Σ FIC 0.52), indifference (Σ FIC 2.00), and antagonism (mean Σ FIC 6.42).

Conclusion: Synergy (17) and additivity (1) were demonstrated *in vitro* with tigecycline plus fluconazole in 90% of *C glabrata* blood isolates using an Etest method. Antagonism was found in one isolate. The mechanisms of synergy or antagonism are unclear. More *C glabrata* isolates should be tested for synergy/antagonism with tigecycline plus fluconazole. *In vitro* results may or may not predict clinical outcome.

6 In Vitro Resistance to Two New Cephalosporin/ β -Lactamase Inhibitor Combination Antibiotics by *Pseudomonas aeruginosa* Isolates from Ochsner Medical Center Patients

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Background: *Pseudomonas aeruginosa* causes serious nosocomial infections. Multidrug resistance has limited effective treatment options. Ceftolozane/tazobactam (FDA approved 12/2014) and ceftazidime/avibactam (FDA approved 2/2015) are novel cephalosporin/ β -lactamase inhibitor couplings that demonstrate antipseudomonal activity. Despite their recent release, nonsusceptibility to both agents has been reported. The aim of this surveillance study was to evaluate *in vitro* activity against clinical *P aeruginosa* isolates from Ochsner Medical Center-New Orleans, where neither agent has been used.

Methods: Nonduplicate consecutive *P aeruginosa* isolates (n=193) were collected from patients during the last 5 months of 2015. Recovery sources were respiratory (45%), urinary tract (24%), wound (16%), bloodstream (9%), or other (6%) infections. Routine identification and antimicrobial susceptibilities were determined. Etests were used to determine minimum inhibitory concentrations (MICs) for ceftolozane/tazobactam and ceftazidime/avibactam. MIC ($\mu\text{g/mL}$) interpretive guidelines were ceftolozane/tazobactam (Clinical and Laboratory Standards Institute) ≤ 4 susceptible, 8 intermediate, ≥ 16 resistant; and ceftazidime/avibactam (FDA) ≤ 8 susceptible, ≥ 16 resistant. Multidrug resistance is defined as nonsusceptibility to ≥ 1 agent in ≥ 3 antimicrobial categories.

Results: For ceftolozane/tazobactam, nonsusceptibility was seen in 13/193 (7%) isolates, including 9/26 (35%) multidrug resistant. For ceftazidime/avibactam, nonsusceptibility was seen in 9/193 (5%) isolates, including 6/26 (23%) multidrug resistant. Five of 193 (3%) were nonsusceptible to both ceftolozane/tazobactam and ceftazidime/avibactam, including 4/26 (15%) multidrug resistant. The MICs ($\mu\text{g/mL}$) ranged from 0.19 to >256 for ceftolozane/tazobactam and 0.25 to >256 for ceftazidime/avibactam. See Table for a summary of *P aeruginosa* isolates nonsusceptible to ceftolozane/tazobactam and ceftazidime/avibactam compared to other nonsusceptible antimicrobial agents (total tested=193).

Conclusion: Even though ceftolozane/tazobactam and ceftazidime/avibactam demonstrated excellent activity compared to commonly used antipseudomonals, nonsusceptibility to both has already occurred. Continued surveillance and judicious use of these agents are required for antimicrobial stewardship to combat further nonsusceptibility and maintain usefulness.

Table.

	Antimicrobial Agents				
	Nonsusceptible Isolates, n (%)				
	Cefepime 40 (21)	Ciprofloxacin 49 (25)	Meropenem 21 (11)	Piperacillin/ Tazobactam 26 (13)	Tobramycin 13 (7)
Ceftolozane/tazobactam nonsusceptible isolates, n (%)	9/40 (22)	8/49 (16)	6/21 (29)	8/26 (31)	5/13 (38)
Ceftazidime/avibactam nonsusceptible isolates, n (%)	6/40 (15)	6/49 (12)	5/21 (24)	5/26 (19)	2/13 (15)

7 The Role of NF- κ B in Cytochrome P450-Mediated Puromycin Aminonucleoside-Induced Glomerular Injury

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8 Accelerated Aging Phenotypes in Diabetic Kidneys Are p66 Dependent

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9 Fibroblast Growth Factor-7 in Chronic Nerve Injury

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Background: Our previous work using a chronic denervation model has demonstrated that treatment with transforming growth factor-beta (TGF- β 1) and forskolin reactivated Schwann cells promoted axonal regeneration. We postulate that this treatment modality promotes axonal regeneration by modulating fibroblast growth factor-7 (FGF-7) expression.

Methods: Adult female Sprague Dawley rats (n=3) were used for chronic tibial nerve injury and delayed repair. After 2 months, the site of injury was repaired and treated with TGF- β 1 (1 ng/mL), forskolin (0.5 μ M), TGF- β 1 plus forskolin, or phosphate buffered saline (PBS)-treated control. Animals were allowed to recover for 8 weeks. The proximal, site of injury, and distal nerve stumps were processed for paraffin sectioning and immunofluorescence staining for FGF-7 and S-100, a marker for Schwann cells.

Results: Immunofluorescence staining found reduced FGF-7 immunoreactivity at the site of injury when compared to the proximal and distal nerve stumps in the TGF- β 1 /forskolin-treated nerve. FGF-7 staining was found localized to S-100-positive Schwann cells as well as in other cells. In the forskolin-treated nerve, FGF-7 immunoreactivity was higher at the site of injury compared to the proximal and distal nerve stumps. In the TGF- β 1-treated nerve, FGF-7 immunoreactivity was found highest in the proximal nerve stump. In the PBS-treated control, FGF-7 immunoreactivity was intense and pronounced in the distal nerve stump and at the site of injury and repair.

Conclusion: To our knowledge, we showed for the first time FGF-7 localization in Schwann cells *in vivo*. Treatment with TGF- β 1 leads to reduced expression of FGF-7, and modulation of FGF-7 expression may be necessary for axonal regeneration.

10 Plasma microRNA Biomarkers for Intracerebral Hemorrhage of Small and Large Volume Size

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Background: Intracerebral hemorrhage (ICH) hematoma volume >30 mL is associated with worse clinical outcomes. Studies have suggested that microRNA (miRNA) profiles change in relation to cerebrovascular diseases. We aimed to determine the difference in circulating miRNA expression in the plasma of patients with acute spontaneous ICH stratified by volumes (<30 mL and >30 mL).

Methods: Patients with acute spontaneous ICH were recruited and categorized into small-volume (<30 mL, n=4) and large-volume (>30 mL, n=4) hematoma groups. Blood samples were collected within 48 hours of admission. miRNAs were prepared from plasma and used for cDNA and real-time polymerase chain reaction (PCR) analysis. Candidate miRNAs were selected from our initial screen of 752 miRNAs using the Exiqon platform. Samples were run on an ABI 7500 fast PCR using a cycle threshold (Ct) of <34 as a cutoff for reliability.

Results: We report here for the first time the presence of miRNA in brain pathogenesis associated with ICH as well as differentiation between small and large hematoma volume. Of the selected miRNAs, we identified miR-204-5p, miR-301b, miR-338-3p, miR-338-5p, miR-33a-5p, and miR-493-5p as potential biomarkers to distinguish low-volume and high-volume ICH. Of these miRNAs, only miR-338-3p was detected in both small- and large-volume ICH with a 7-fold reduction in large-volume ICH. Expressions of miR-204-5p, miR-301b, miR-33a-5p, miR-338-5p, and miR-493-5p were detected in small-volume ICH plasma but were nondetectable in high-volume ICH. Finally, miR-122-5p was found in moderate abundance across all samples.

Conclusion: These results suggest distinct differences in expression of miRNA in plasma between <30 mL and >30 mL hematoma. Expressions of these selected miRNAs were reduced or not detectable in large-volume ICH, suggesting a potential loss of miRNA-mediated gene repression. Expression of these miRNAs may serve as potential biomarkers to predict ICH hematoma volume.

11 Feasibility and Application of Additive Manufacturing in the Neurosciences

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Background: Since the advent of 3-dimensional (3-D) printing in the 1980s, it has grown rapidly to be an adjunct in many industries, including medicine. Three-dimensional printing has many uses in the medical field including implant and tissue design, medical research, and training and is emerging as an essential tool for operative planning and training in multiple fields including neurosurgery. An individual with a history of achondroplastic dwarfism and previous lumbar laminectomies presented to the Ochsner Spine and Back Clinic with progressive leg weakness that had failed conservative therapy. The patient had a complex spine pathology including degenerative lumbar kyphotic deformity and resultant multilevel neuroforaminal and central stenosis. To better understand the anatomy, assess the risks and benefits of intervention, and optimize the surgical approach, we attempted to render 3-D models from traditional 2-dimensional (2-D) neuroimaging.

Methods: The neuroimaging was obtained and deidentified in a standard process in conjunction with the Ochsner Radiology Department. Deidentified files were postprocessed to remove unwanted artifacts and isolate the bony layers for rendering utilizing Mimics software. The 3-D object file was exported to a stereolithography (STL) file that was then rendered on an EOS P390 printer utilizing PA2201 powder material.

Results: Please see the Figure for our results.

Conclusion: This feasibility study concluded with a successful rendering of a prototype. We were able to convert and postprocess 2-D neuroimaging files into STL files and render in 3 dimensions. With the aid of our model, the patient underwent a successful posterior thoracolumbar instrumented fusion of T10 to pelvis. Subsequent studies will assess 3-D printing as a tool to improve training of medical providers, quality of care, and procedural outcomes.



12 Location of Prophylactic Vertebral Cement Above Long-Instrumented Constructs Affects Junctional Endplate Stress: A Finite Element Model

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Background: Proximal junctional kyphosis (PJK) is not uncommon and can result in significant complication after spinal deformity surgery. Prophylactic vertebroplasty can reduce the rate of PJK, but optimal cement location or configuration has yet to be analyzed. Using a finite element (FE) model, we analyzed various locations of a tapered dose of vertebral cement to see how it influences junctional endplate stress and ligamentous strain.

Methods: A validated FE T6 pelvis osteoporotic spinal model was modified with screws/rods from T10-S1 and a tapered dose of vertebral cement in T10 (4 cc), T9 (3 cc), and T8 (2 cc). Anterior, right lateral, left lateral, and staggered cement configurations were analyzed and compared to the gold standard of central placement. With the pelvis fixed, load was applied 10 mm anterior to the center of T6 to simulate a flexion moment. Endplate stresses (T7-T9) and posterior ligamentous strain were recorded.

Results: Anteriorly placed cement resulted in a 26% decrease in maximum superior endplate stress at T9 and a 21% decrease at T8 vs centrally located cement. Maximum endplate stress at T7 was similar for anterior vs central cement. Staggering the cement resulted in similar T7-T9 endplate stress and ligament strain vs centrally placed cement. Posterior ligamentous strain was reduced by 2% at the T8-T9 level with anterior placement.

Conclusion: Anterior placement of prophylactic vertebral cement was advantageous compared to the gold standard of centrally placed cement in this FE model. Stresses at the endplates of T8 and T9 were reduced considerably with anteriorly placed cement. Posterior ligamentous strain was also reduced with anteriorly placed cement. However, staggering cement placement did not affect endplate stress or ligamentous strain. The effect of anterior cement placement may reduce endplate stress. A decrease in maximal endplate stress is beneficial and translates to an increase in force required for endplate failure and possibly PJK.

13 Would Resting a Lateral Interbody Cage Across the Ring Apophysis in the Lumbar Spine Mitigate Endplate Violation?

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Background: Lateral lumbar interbody fusion (LLIF) has increased in popularity because of its biomechanical- and complication-related advantages over the anterior and posterior interbody surgical approaches. When performing the lateral technique, larger cages that span the ring apophysis maximize contact of the cage with the periphery of the endplate and could mitigate potential endplate issues secondary to violation during discectomy or poor bone quality.

Methods: Eight fresh-frozen human lumbosacral spines were used for this study for a total of 40 specimens randomized into 4 groups (G) with 10 specimens per group: G1, intact endplate with short cage; G2, intact endplate with long cage spanning the ring apophysis; G3, endplate decortication with short cage; and G4, endplate decortication with long cage spanning the ring apophysis. Load displacement data were collected at 5 Hz until failure, defined as cage subsidence of >5 mm or fracture of the vertebral endplate that resulted in axial displacement of the actuator >5 mm.

Results: Longer cages spanning the ring apophysis provided more strength in compression with less subsidence relative to shorter cages, regardless of endplate integrity. Longer cages spanning the ring apophysis and resting on intact endplates (G2) had a significant ($P<0.05$) increase in strength and less subsidence compared to the smaller cage group resting on intact endplates (G1) ($P=0.003$). Longer cages spanning the ring apophysis of intact endplates (G2) showed a significant ($P<0.05$) increase in strength in compression and resistance to subsidence compared to similar length cages resting on decorticated endplates (G4) ($P=0.028$).

Conclusion: Spanning the ring apophysis increases the load to failure by 40% with intact endplates and by approximately 30% with decorticated endplates. Larger cages that span the vertebral body ring apophysis could improve the compressive strength and decrease subsidence at the operative level despite endplate violation or poor bone stock.

14 Reduced Rate of Proximal Junctional Fractures Above Long-Instrumented Constructs Utilizing a Tapered Dose of Vertebral Cement – A Biomechanical Study

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Background: Proximal junctional kyphosis (PJK) is not uncommon and can result in significant complication after spinal deformity surgery. Increased mechanical stress at the proximal junction due to the transition of a fixed to a mobile spine segment and osteoporosis are risk factors for PJK. We utilized a tapered dose of cement in T10, T9, and T8 to reduce the rate of proximal junctional fractures.

Methods: Fifteen ligamentous, osteoporotic T6 pelvic specimens with screw/rod instrumentation from T10-S1 were divided equally: Group 1, no cement; Group 2, 4 cc of cement in T10 and 4cc in T9; and Group 3, 4 cc of cement in T10 (upper instrumented vertebra [UIV]), 3 cc total in T9 (UIV +1), and 2 cc in T8 (UIV +2). The pelvis and T6 vertebra were potted, and compression was applied 10 mm anterior to the center of T6 using an MTS Systems Corporation actuator. Maximum load to failure was measured in newtons (N). The spines were evaluated using fluoroscopy and computed tomography.

Results: There was a significant reduction in fractures in Group 3 vs Groups 2 and 1 (0 vs 5 vs 5, respectively; $P=0.0019$). Posterior ligamentous rupture occurred in 4 specimens in Group 3, 3 in Group 2, and 1 in Group 1. The mean peak load-to-failure values showed an increasing trend from Groups 1 to 3 ($P=0.38$). There was no difference in specimen dual-energy x-ray absorptiometry values ($P=0.71$). Finite element analysis (FEA) mirrored the cadaveric data, and the maximum load to failure increased from Groups 1 to 3. Endplate stresses were reduced in Group 3 vs Groups 2 and 1.

Conclusion: In both cadaveric and FEA models, tapering the dose of cement in Group 3 decreased endplate stresses, increased the load required for failure, and significantly reduced vertebral fractures above long-instrumented constructs. This technique may protect the spine from PJK due to fracture but may increase the risk of posterior ligamentous failure.

15 Laser-Modified Polyetheretherketone Implants as an Adjunct to Interbody Fusion: A Sheep Model

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Background: Polyetheretherketone (PEEK) cages have a modulus of elasticity similar to bone but have been criticized due to the lack of osteointegration. Laser technology has been used to imprint mimetic surface patterns on PEEK implants that mirror isotropic bone in an attempt to enhance fusion. *In vitro* cell culture analysis suggests laser surface etching enhances the deposition of matrix and preferentially encourages the attachment of bone.

Methods: Identical implants were placed in 20 sheep using an anterior approach to C3-4 with supplemental plating. Sheep were divided into 4 groups: Group 1, mimetic patterning without autograft; Group 2, mimetic patterning with autograft; Group 3, no mimetic patterning with autograft; Group 4, no patterning without autograft. Sheep were analyzed by radiography, computed tomography (CT), magnetic resonance imaging, and histopathology. Nine sheep were sacrificed at 3 months. At 6 months, the remaining 11 sheep were analyzed.

Results: Radiographs and viable CT scans of all 20 sheep at 3 months demonstrated the greatest radiographic evidence of fusion in Group 1. At 3 months, Group 1 demonstrated more abundant mineralized matrix and bony attachments at the implants' mimetic surface interfaces consonant with fusion via histology. The 11 sheep available for analysis at 6 months sustained evidence of lamellar bone formation adjacent to the implant, reduction in fibrosis, and a more cellular and highly vascularized bone.

Conclusion: Surface modification of PEEK spinal implants with a pattern and topography that mirrored isotropic bone enhanced fusion in a large animal model. *In vitro* cell culture analysis had suggested laser surface etching boosted the deposition of mineralized matrix and preferentially encouraged the attachment of bone cells. Three-month micro-CT and histological data, extended to additional corroboration at 6 months by both radiography and histology, confirmed these findings in the sheep model.

16 Transfusion-Related Acute Lung Injury: A Histologic Approach to Qualify Tissue Damage from Red Blood Cell Storage Duration and Heat Treatment in an Animal Model

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17 Role of NF1 Loss of Function in Aberrant mTOR Activation and Resistance to Therapy in Tumor Spheroids of Hepatocellular Carcinoma

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Background: Hepatocellular carcinoma (HCC) rates are steadily increasing worldwide. HCC is highly resistant to therapy, with surgical resection/transplantation as the only curative option. Posttransplantation recurrence risk is high, with 5-year disease-free survival following transplantation estimated at 40%-60%. Biomarkers identifying high recurrence risk and strategies to target recurrence are in great need. Approximately 40% of HCCs display aberrant activation of mTOR. Posttransplant immunosuppressive regimens targeting mTOR have shown promise in extending patient survival and reducing recurrence rates. To identify a genetic signature associated with aberrant mTOR activation, we have focused on NF1, a negative regulator of mTOR through TSC2. NF1 loss-of-function mutations are present in ~5% of HCC cases although little is known regarding the role of NF1 in HCC. For this study, we created an NF1 knockout (NF1KO) HCC line to study the role of NF1 in mTOR hyperactivation, development and function of tumor spheroids, and resistance to mTOR inhibitors.

Methods: CRISPR using gRNAs targeting NF1 in a human HCC cell line, skHEP1, was used to generate NF1KO cell lines. NF1KO and mock control lines were analyzed under both adherent (serum-free and complete media) conditions and nonadherent conditions in tumor spheroid propagation media ± mTOR inhibitors. Proliferation was quantified by MTT assay, and mTOR pathway activation was quantified by western blot.

Results: Puromycin-resistant clones expanded after transfection did not express NF1 at the protein level. NF1 knockout skHEP1 cells had elevated activation of mTOR quantified by increased activation of the mTOR substrate p70S6. NF1KO cells readily formed spheroids in tumor spheroid media and proliferated in both serum-free and complete media.

Conclusion: We successfully developed a NF1 knockout HCC line characterized by elevated activation of mTOR. We are currently evaluating the sensitivity of NF1KO cells to mTOR inhibition using sirolimus as well as small molecule mTOR inhibitors.

18 Free Fatty Acid Receptor Signaling in Hepatocellular Carcinoma Tumor Spheroid Formation and Therapeutic Resistance

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Background: Cancer stem cells (CSCs) have been implicated in therapeutic resistance, recurrence, and metastasis. CSCs, expanded *in vitro* as tumor spheroids, have increased expression enzymes and transcription factors that drive lipogenesis. Stearoyl-CoA desaturase 1 (SCD1) is a critical enzyme in the lipogenesis pathway and highly upregulated in hepatocellular carcinoma (HCC). Inhibiting SCD1 blocks spheroid formation by impairing Akt/SREBP-1-mediated lipogenesis, which is reversible by exogenous free fatty acid (FFA). Extracellular FFAs are capable of signaling through FFA receptors (FFARs) but are taken up by CD36. SCD1 is a difficult target due to intracellular location and importance in physiological function. The purpose of this study was to delineate FFA signaling and uptake in spheroid development and function.

Methods: The HCC line skHEP1 was cultured to promote tumor spheroid formation in tumor spheroid media (TSM). TSM was supplemented with fatty acid or was fatty acid free. Spheroids were generated ±mTOR inhibitors rapamycin and PP242, FFAR agonists/antagonists, or IP3 receptor antagonist 2-ABP.

Results: SkHEP1 spheroids expressed SCD1 and nuclear SREBP-1, along with activated mTOR and its substrate p70S6. In fatty acid-free conditions, spheroid development was reduced with decreased activation of mTOR and SREBP-1. Inhibiting mTOR mimicked FFA deficiency, reducing spheroid size and SREBP-1 nuclear localization. Exogenous delivery of the FFA oleate increased mTOR and SREBP-1 activation in a concentration-dependent manner.

Conclusion: Our results show that FFA promotes tumor spheroid development by reinforcing mTOR activation and lipid synthesis in HCC. Studies underway are evaluating the ability of exogenous FFA to rescue tumor spheroid formation in the presence of an FFAR1 antagonist. We are also testing whether an FFAR1 agonist can recapitulate the effect of oleate under SCD1 inhibition. Collectively, our results will determine the utility of FFAR1 antagonists alone or paired with mTOR inhibitors in the ability to block tumor spheroid formation and/or overcome resistance to therapy.

19 Alarmin Response in Macrosteatotic Rats Following Ischemia/Reperfusion Injury

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Background: Increasing rates of nonalcoholic fatty liver disease have contributed to elevated macrosteatosis in liver procurements for orthotopic liver transplantation (OLT). While mild macrosteatosis is manageable in OLT, moderate to severe macrosteatosis has been linked to necrosis and organ failure following ischemia/reperfusion (I/R) injury. Alarmins are molecules released from damaged cells that signal tissue damage and trigger immune cell infiltration/activation. Inhibitors targeting TNF α -mediated necroptosis can limit alarmin release and preserve organ function in animal models. In this study, we investigated necroptosis-mediated alarmin release from livers with increasing macrosteatosis undergoing I/R injury.

Methods: Varying degrees of macrosteatosis were induced by a methionine-choline-deficient (MCD) diet regimen in rats. Macrosteatotic rats and dietary controls were subjected to warm I/R by occluding vessels supplying the left lateral and median lobes of the liver for 1 hour, followed by predetermined reperfusion periods. The percentages of macrosteatosis and tissue necrosis were quantified by hematoxylin and eosin and Oil Red O staining. Liver damage was assessed by ALT assay. The alarmins IL-33 and HMGB1 were measured by ELISA.

Results: Distinct states of macrosteatosis were achieved with the MCD diet, progressing from mild steatosis (1 week), to mild/moderate macrosteatosis (2 weeks), and to moderate/severe macrosteatosis (3 weeks). Elevated baseline serum and tissue alarmin levels were observed as macrosteatosis increased. I/R injury led to a significant increase in alarmin levels associated with severe hepatocyte necrosis and loss of liver function with increasing macrosteatosis.

Conclusion: Elevated baseline alarmin levels in macrosteatotic rats correlated with 1-week survival following I/R injury, with alarmin levels mirroring necrosis and ALT trends during reperfusion. These results suggest tissue/serum alarmins may be a predictive biomarker for predisposition to organ failure in macrosteatotic liver transplantation. Future work will focus on inhibiting TNF α -mediated necroptosis to block alarmin release with the goal of improving outcomes and expanding the OLT donor pool.

21 Examining the Efficacy of the Novel Anticancer Therapeutic Withaferin-A in an Orthotopic Mouse Model for Colorectal Cancer

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Background: The inhibitors currently used against colorectal cancer (CRC) can reduce tumor burden and alleviate the disease but come with drawbacks of high toxicity and decreased effectiveness over time. As a result, novel anticancer therapies are being researched and evaluated via *in vivo* studies and clinical trials. Withaferin-A (WA) is a withanolide derived from the leaf extract of *Withania somnifera* that has previously displayed antitumor activity against various cancer cells such as leukemia, adrenal cancer, and breast cancer. It has exhibited these abilities both *in vitro* and *in vivo* in subcutaneous injections of CRC cell line HT-29. We hypothesize that withanolide drug analogs may be potent, selectively targeted inhibitors of CRC in our orthotopic mouse model.

Methods: NOD/SCID male mice (5 per group) were coinjected with 1×10^4 luciferase-tagged human CRC HT-29 cells and 3×10^5 lymph node stromal HK cells in the submucosal layer of the rectum. At 14 days, treatment began by intraperitoneal injection of WA variants dissolved in Captisol (WA-X030 at 8 mg/kg or WA-X033 at 6 mg/kg) daily for 28 days. Control mice did not receive drugs. Mice were imaged by bioluminescent imaging once a week for tumor burden. Mice were sacrificed at week 6 while monitoring for toxicity (dramatic decrease in body weight, tumor burden, and general health).

Results: Mice tolerated the tumor cell injection and treatments. The more potent (*in vitro*) WA analog WA-X033 caused a strong inhibition of tumor growth compared to the control group. The analog WA-X030 did not inhibit tumor growth as significantly compared to the control group.

Conclusion: Withanolides are a novel class of chemotherapy drugs that demonstrate specific anticancer effects *in vitro* and *in vivo*. Withaferin-A shows promise as a novel CRC therapeutic agent and warrants further study to determine its potential as a form of cancer treatment.

22 Biomarkers for Colorectal Cancer Metastasis—Potential Therapeutic Targets

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Background: Cancer stem cells (CSC) play a crucial role in the metastasis of colorectal cancer (CRC). We have previously shown that CD133⁺CXCR4⁺ CRC-CSCs in primary tumors positively correlate to lymph node (LN) metastasis. In addition, distant organ metastasis is mediated by interactions between CRC-CSCs and LN stromal microenvironment. Another receptor—CD318—is coexpressed with other CSC markers and confers sphere formation, making it a key factor in the aggressiveness of CRC in an *in vivo* model. Our goal was to validate whether CD133, CXCR4, and CD318 are also CRC metastatic biomarkers, as well as to identify additional biomarkers.

Methods: A tissue microarray (TMA) containing matched primary CRC and metastases from 23 patients was constructed. The expression levels of potential CRC-CSC markers (CD133, CXCR4, CD318, Ki-67, LGR5, NGFR, and PD-L1) were detected by immunohistochemical staining. The slides were scanned into digital files. Expression levels of each biomarker in primary tumor and matched metastatic lesion were quantified via digital analysis using Image-Pro software and compared for significance using *t* tests.

Results: Both CD133 and CXCR4 were expressed at a higher level in metastases vs primary tumors ($P < 0.0001$). Ki-67, LGR5, NGFR, and PD-L1 are also promising as metastatic biomarkers with higher expression levels in metastases vs primary tumors ($P < 0.0001$). However, CD318 showed a similar level of expression in primary and metastatic tumors ($P = 0.5049$).

Conclusion: Our data confirmed CRC-CSC markers CD133 and CXCR4 are also CRC metastatic biomarkers and identified Ki-67, LGR5, NGFR, and PD-L1 as potential additional biomarkers. In contrast, the expression levels of CD318 were not further enriched in metastatic tumors. It is likely that the combination, rather than individual, expression of biomarkers is important for CSC metastatic spread. These biomarkers warrant further investigation as they could lead to potential therapeutic targets.

23 Lymph Node Stromal Microenvironment Promotes Renal Cell Carcinoma Metastasis Via Vimentin Upregulation

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Background: Renal cell carcinoma (RCC) incidence is increasing, and incurable metastases affect up to 25% of patients with RCC. Previously, using our unique patient-derived orthotopic xenograft (PDOX) model that mimics metastatic RCC, we showed that lymph node (LN) stromal cells enhanced tumorigenicity and metastases of certain RCC cell lines and patient tumor specimens. The objective of this study was to identify the potential molecular mechanisms that promote metastases with emphasis on epithelial-mesenchymal transition (EMT).

Methods: Luciferase-tagged human RCC cell lines (A498, CAKI-1, and SN12K1) and one patient tumor (KiCa58) cell type were implanted by subcapsular kidney injection into NOD/SCID mice with or without LN stromal HK cells for tumor growth and metastases. Upon necropsy, paraffin-embedded primary tumor and lung slides were observed with hematoxylin and eosin stain and immunohistochemistry using an antibody against human vimentin. Aperio software analysis of digital scans was used to quantify vimentin expression levels in primary tumor and to compare for significant differences by *t* tests.

Results: The presence of HK cells significantly enhanced RCC tumor formation and lung metastases in 2/3 cell lines (A498 and CAKI-1) and KiCa58 cells. SN12K1 cells developed tumor and lung metastases independent to HK cells. Vimentin, an EMT marker, was significantly elevated in xenografts of A498 (98.8% vs 94.4%, $P < 0.0001$), CAKI-1 (95.9% vs 88.9%, $P < 0.000$), and KiCa58 cell (96.7% vs 87.7%, $P = 0.0027$) tumors that were co-injected with HK cells vs without HK cells. In contrast, the vimentin expression level (97.2%) in SN12K1 tumors was not further enriched by the presence of HK cells. Additionally, vimentin expression was positively correlated with lung metastasis ($P < 0.0001$).

Conclusion: Our data confirmed that HK cells promoted RCC progress via enhanced EMT. EMT may play a crucial role in RCC progression, drug resistance, and metastasis. Thus EMT biomarkers such as vimentin may serve as therapeutic targets.

24 Establishing Models to Investigate the Effect of Lymph Node Microenvironment in Pancreatic Adenocarcinoma Progression

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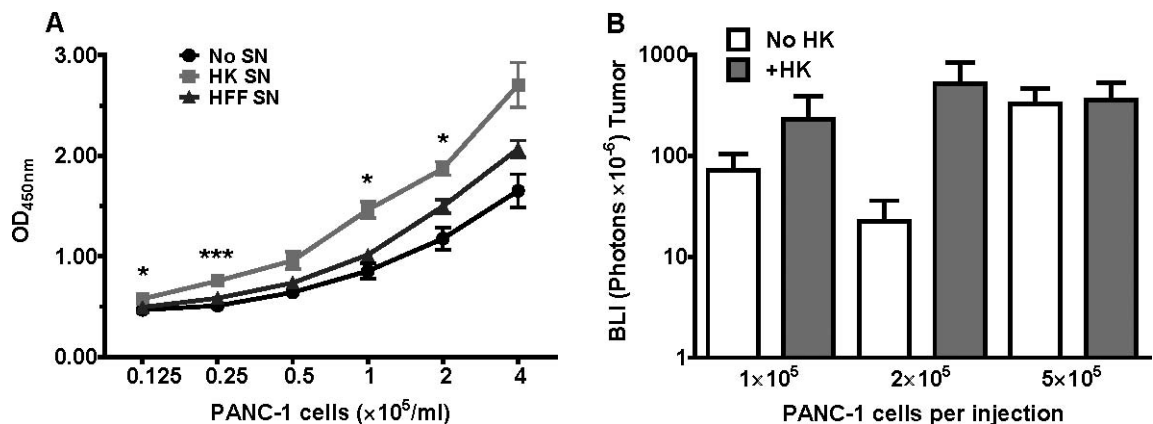
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Background: Pancreatic adenocarcinoma (PAC) is the fourth leading cause of cancer death in the United States, with metastatic PAC affecting 60%-80% of patients at diagnosis. A thorough understanding of PAC progression is required for early detection and effective interventions. *In vitro* and *in vivo* experiments involving cancer cell lines remain convenient starting points for discovery and proof-of-concept studies. We developed and investigated the effect of lymph node stromal cells (LNSCs, HK cells) on PAC cell growth *in vitro* and tumor progression *in vivo*.

Methods: Pancreatic cell lines PANC-1 and Hs766T were cultured with and without HK cell- and fibroblast cell (HFF)-conditioned media. Tumor cell proliferation rates were examined using MTT assay at 48 hours. PANC-1 and Hs766T cells were luciferase tagged and injected intrapancreas of NOD/SCID mice with and without HK cells. Tumor growth and metastasis were measured weekly by bioluminescent imaging (BLI). At necropsy 6 weeks after tumor cell injection, the primary tumor and the lung and liver were evaluated via BLI, hematoxylin and eosin stain, and immunohistochemistry staining.

Results: MTT assay data confirmed HK cell-conditioned media increased proliferation of PAC cells (Figure 1A). The differences between the presence of HK cell- and HFF cell-conditioned media are significant per *t* tests. In orthotopic xenograft models using PANC-1 and Hs766T cell lines, at $1-2 \times 10^5$ tumor cell injected mice, tumor size and metastasis were enhanced in groups receiving co-inoculation of PAC and HK cells (3×10^5 cells, +HK) vs control groups (no HK, Figure 1B).

Conclusion: We established *in vitro* and *in vivo* PAC models and observed that the LNSC microenvironment promotes PAC progression. These models can be used to develop LNSC-targeted therapies and patient-derived orthotopic xenografts for individualized therapeutic approaches.



25 Establishing a Humanized Model for Epstein-Barr Virus–Associated Gastric Carcinoma Using Human Hematopoietic Stem Cells and NSG Mice

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Background: Studies have confirmed a link between gastric carcinoma (GaCa), the second leading cause of cancer-related death in the world, and Epstein-Barr virus (EBV), although how the virus contributes to cancer is unclear. Our goal was to establish a humanized-mouse xenograft model with reconstituted human immune responses to understand the effects of EBV on the GaCa tumor microenvironment.

Methods: NOD/SCID IL-2Rg^{-/-} (NSG) mice were irradiated with various Gy within 48 hours postbirth and injected intraliver with luciferase-tagged human cells (colon cancer HT-29Luc or GaCa SNU-719Luc) and human hematopoietic stem cells (HSC). Tumor growth was visualized weekly via bioluminescent imaging. Tumors and organs were sectioned (5 μm) and stained with hematoxylin and eosin. Human T and B cells in mouse spleen, bone marrow, and blood were examined by flow cytometry.

Results: We compared different intraliver injection methods and found a planar approach through the skin of the mouse abdomen to be optimal for liver uptake. NSG pups survived into adulthood with up to 3 Gy irradiation if given 1×10^6 peripheral blood human HSC or 3×10^5 CD34⁺ umbilical cord blood cells. One hundred percent and 75% of mice developed imageable tumors 3 weeks postinjection of HT-29Luc or SNU-719Luc cells with human HSCs, respectively. Stained tissue sections showed tumor engraftment in the livers of these mice. 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.

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 plays in modulating the GaCa tumor microenvironment and host immune responses which could lead to the discovery of therapies for EBV-associated GaCa.

26 Establishment of a Patient-Derived Orthotopic Xenograft Model for Drug Targeting Renal Cell Carcinoma Metastasis

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Background: Renal cell carcinoma (RCC) has widely varying prognoses and therapy responses, and metastatic RCC is incurable with a 5-year survival rate of <10%. Our objective was to use an avatar approach to compare the efficacy of various treatment combinations in alternating sequence on our unique patient-derived orthotopic xenograft (PDOX) model.

Methods: We injected 1×10^5 luciferase-tagged human RCC specimen cells (KiCa-Pt58, a sarcomatoid case) subcapsularly into the left kidneys of NOD/SCID mice. Mice bearing kidney tumors were split into 5 groups (n=9, Table). The treatment groups received set concentrations of drugs (sunitinib, pazopanib, or everolimus), and the control group received water. All were given 3 times per week via gavage beginning 1 week after cancer cell injection. Tumor growth was monitored weekly by bioluminescent imaging (BLI). Drugs were changed in cases of tumor growth not responding to treatment compared to the control group; drugs were only changed once. Organs and tumors were collected upon necropsy and imaged via BLI; tumor weights were recorded.

Results: Mice that received a pazopanib switch to everolimus sequence expressed the most positive results when compared to controls among all treatment groups; primary tumor weights were significantly lower than in nontreated mice. More important, this combination had the greatest effect on lung metastasis. While other treatments were successful in diminishing the primary tumor size, none was as effective at preventing/limiting metastasis to the lung at the same time, which can be vital for patient survival.

Conclusion: Combination chemotherapies may prove to be advantageous for treating RCCs. When used alternatively, more favorable results were seen in regard to primary tumor growth and metastasis. An avatar approach can effectively assist personalized therapy in RCC.

Table. An Avatar Approach in PDOX Model to Screen RCC Drug Responses in Primary Tumor Growth and Lung Metastasis

Group	Treatment	Primary Tumor		Lung Metastasis	
		Weight (g)	P Value ^a	BLI $\times 10^6$	P Value
1	Control (no treatment)	2.40 \pm 0.61 ^b		802.54 \pm 224.6	
2	Everolimus ^c \rightarrow Sunitinib	0.19 \pm 0.07	0.002	320.70 \pm 194.7	0.124
3	Pazopanib \rightarrow Sunitinib	3.17 \pm 0.95	0.517	1121.88 \pm 654.5	0.652
4	Sunitinib \rightarrow Everolimus	0.88 \pm 0.23	0.034	244.34 \pm 99.71	0.039
5	Pazopanib \rightarrow Everolimus	0.38 \pm 0.10	0.006	94.25 \pm 41.20	0.008

^aP values of the difference between various sequential treatments and nontreated control groups analyzed using student *t* tests (n=9). Bold numbers indicate significant difference ($P < 0.05$).

^bNumbers indicate mean \pm SEM, n=9.

^cDrug doses: 40 mg/kg sunitinib, 40 mg/kg pazopanib, or 5 mg/kg everolimus.

27 Effects of Human Lymph Node Stromal Cell-Derived Microvesicles on Colorectal Cancer Progression in a Patient-Derived Orthotopic Xenograft Model

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Background: Colorectal cancer (CRC) is a leading cause of cancer death with its mortality frequently linked to its ability to form distant metastasis. During metastasis, CRC cells acquire a more aggressive phenotype allowing for increased proliferation, invasion, and chemotherapeutic resistance. To understand the role of microvesicles (MVs) in CRC, we isolated MVs from lymph node stromal cell HK cells (HK-LNSC) and patient-derived LNSCs (Pt-LNSCs) and investigated their pathological role in tumor progression in a patient-derived orthotopic xenograft model.

Methods: Pt-LNSCs were isolated from mesenteric lymph nodes. MVs were collected from HK cells or Pt-LNSCs using ultracentrifugation. DLD-1, a CRC cell line, was cultured with and without MVs, and a dose-response effect on cell growth was determined using MTT assays. *In vitro* cell migration, invasion, and cell cycle profile analysis will also be investigated. Our previously described murine orthotopic CRC model was used in which luciferase-tagged patient-derived CRC (Pt-CRC) cells or DLD-1 cells were injected into the rectal submucosa of NOD/SCID mice with or without MVs. Tumor growth was analyzed weekly by bioluminescent quantification using the In Vivo Imaging System.

Results: DLD-1 cells showed an MV concentration-dependent cellular proliferation *in vitro*. During 10 weeks, MVs promoted the take rate and size of DLD-1 tumor growth in mice. MVs also caused an increase in Pt-CRC cell tumor growth in this model system. Metastases found in lung sections were more prevalent when MVs were injected along with the tumor cells. The effects of MVs on cell migration and their influence on cell cycle progression will be tested.

Conclusion: We have shown that human MVs promote oncogenesis, growth, and metastasis of both CRC cell lines and Pt-CRCs *in vitro* and *in vivo*. This indicates that specific proteins, mRNAs, and miRNAs carried by MVs may be useful as targets for therapeutic drugs in the future.

28 A Patient-Derived Tissue Database/Bank for Genetic Analysis of High- and Low-Aggressive Prostate Cancer in Caucasian and African American Men

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Background: Prostate cancer (PCa) is the most common visceral cancer in men, with 220,000 new cases in the United States last year. While significant morbidity and mortality are associated with the disease, many cases are indolent and do not require treatment. Therefore, deciding whether or not to treat patients can be difficult. Our goal was to establish a race- and disease aggressiveness-specific patient-derived tissue database/bank to aid genetic characterization of PCa to help the clinician in making this decision.

Methods: A database search using the keyword “prostate cancer” was performed. The charts of all PCa cases from 1990-2013 with pathological specimens in the form of paraffin blocks available in the Ochsner pathology department archive were reviewed. Data pertaining to race and aggressiveness of PCa, including age, Gleason score, and prostate-specific antigen levels, were collected. Four groups of patients were identified as African American (AA) and Caucasian American (CA) with either high- or low-aggressive PCa. The pathological specimens from each group were then retrieved and submitted to Dr. Wanguo Liu’s laboratory for DNA isolation and genotyping mutations.

Results: A total of 3,800 PCa cases were identified. In 1,654 cases that were completed with chart reviews, we found 43%-46% of the cases had pathology specimens. Among these cases, 34% were AA and 64% were CA patients. In the AA group, we identified 189 low-aggressive and 54 high-aggressive cases. In the CA group, the numbers were 385 and 118, respectively. Preliminarily, specimen blocks of 30 patients from each group were retrieved; tissues were cut and submitted for genetic studies using the exome sequencing approach.

Conclusion: We have established a patient-derived tissue database/bank for PCa. It can help reveal genetic patterns in high- and low-aggressive PCa that will eventually help in making accurate treatment decisions at the personalized patient level.

29 Thromboprophylaxis With Heparin During Orthotopic Liver Transplantation: Comparison of Hepcon HMS Plus and Anti-Xa Assays for Low-Range Heparin Concentration Monitoring

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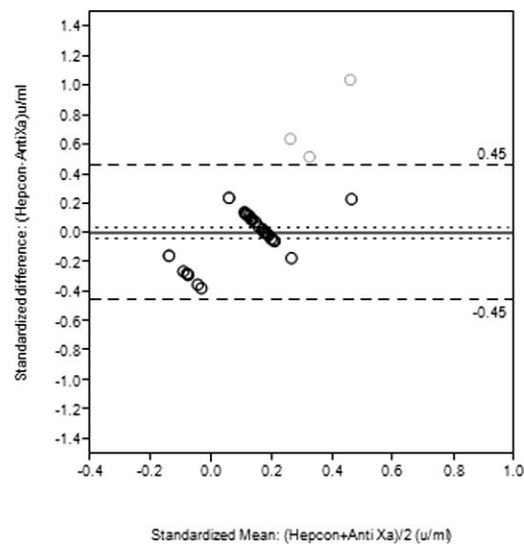
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Background: The purpose of this study was to compare two heparin assays—Hepcon HMS Plus/Kaolin-Activated Clotting Time (ACT) (whole blood heparin assay) and anti-Xa (plasma heparin assay)—in patients undergoing orthotopic liver transplantation (OLT) to whom a median dose of 2,000 units of heparin was given before caval cross-clamping.

Methods: Following institutional review board approval, data from the medical records of 38 consecutive adults who underwent OLT were abstracted for analysis. Paired arterial blood samples were collected before surgical incision, 5 minutes after intravenous heparin administration but before caval cross-clamping, 5 minutes after portal cava reperfusion, 5 minutes after hepatic artery reperfusion, and 1 hour after hepatic artery reperfusion.

Results: A total of 152 pairs of heparin assay measurements underwent Bland-Altman analysis. As the Hepcon HMS assay cannot discriminate between heparin concentrations <0.4 units/mL, a difference of $\leq \pm 0.4$ units/mL was used as clinically acceptable. As the initial Hepcon-anti-Xa assay differences were significantly different from zero (t test 8.9, $P < 0.0001$, reflecting a fixed bias) a modified Bland-Altman plot was generated so each measure was standardized to a mean of zero. The difference between the 2 standardized assay measurements (Hepcon-anti-Xa) was plotted against the standardized mean of the 2 assay measurements (Hepcon+anti-Xa)/2 (units/mL) (Figure).

Conclusion: Because 96% of measurements (146/152 data points) were within the predetermined limits of agreement ($\pm 1.96 \cdot SD \leq \pm 0.4$ units/mL), the 2 methods were judged to be interchangeable.



30 Predictors for Successful Extubation Following Liver Transplantation

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Background: Previously, liver transplant patients underwent routine postoperative mechanical ventilation in the intensive care unit. However, extubation in the operating room, or shortly thereafter, has been shown to be safe with proper patient selection.

Methods: Data were abstracted from 703 medical records (2008-2013) to develop a feasibility profile for successful orotracheal extubation within 6 hours following liver transplantation at Ochsner Medical Center.

Results: Successful extubation within 6 hours following liver transplantation was done in 10% (71/703) of patients. The reintubation rate was 1/71 (1.4%). Following logistic regression analysis, predictors for successful orotracheal extubation are shown in the Table. This model had a misclassification rate of 10%. Lack-of-fit analysis suggests this model is robust and that sufficient predictors are present for predicting early orotracheal extubation ($\chi^2=16.1$, $P=0.8847$); however effect size calculations were small.

Conclusion: In patients undergoing liver transplantation, opportunities exist to facilitate postoperative recovery and improve resource utilization. The use of robust statistics can guard against incorrect declarations of significance in large databases and can assist clinicians in development of predictive clinical care protocols that minimize error.

Nominal Logistic Fit for Extubation ≤ 6 hrs in 703 Patients Following Liver Transplantation

Effect Summary Report	False Discovery Rates		Effect Size	FDR P Values
	LogWorth Statistic			
Absence of fibrinolysis	2.220		0.1249	0.00602
Male gender	2.220		0.1183	0.00602
Absence of intraoperative RRT	1.955		0.1197	0.01110

Whole model $\chi^2=42.0$, $P<.0001$; RRT: renal replacement therapy

31 Role of Intraoperative Crystalloids on Hospital Length of Stay Following Esophageal Resection

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Background: Studies are unclear regarding optimal intraoperative fluid management during surgery. The purpose of this retrospective 2.5-year study was to investigate the role of intraoperative crystalloids on postoperative hospital length of stay (phLOS) and on pulmonary adverse events (pAEs) in 76 patients following esophageal resection.

Methods: Patient data included previously reported demographics, comorbidities, and intraoperative crystalloids on the duration of phLOS and incidence of pAEs. Categorical variables were presented as percentages, with differences between groups assessed using chi-square tests. Continuous variables with skewed distributions were presented as median and 25%-75% interquartile range with differences between groups assessed by the Wilcoxon rank sum test. Recursive partitioning was utilized to determine the optimal cutoff values for intraoperative crystalloid administration when plotted against phLOS to allow comparisons between the 2 groups.

Results: Higher volumes of intraoperative crystalloids were significantly associated with shorter phLOS ($P=0.0165$). Recursive partitioning observed in patients who received $<3,600$ mL had a mean phLOS of 15.4 days, whereas patients who received $>3,600$ mL had a mean phLOS of 10.9 days. There was no statistical association of intraoperative crystalloid administration on the incidence of pAEs ($P>0.6$).

Conclusion: The amount of intraoperative crystalloids administered during esophageal resection has a significant association on phLOS but not on the incidence of postoperative pAEs. The dose-response nature of the analysis supports causality. We cannot confirm support of a restrictive intraoperative crystalloid administration but rather a liberal crystalloid administration strategy during esophageal resection.

32 Distal Peripheral Nerve Blocks in the Forearm as an Alternative to Proximal Brachial Plexus Blockade in Patients Undergoing Hand Surgery: A Prospective and Randomized Pilot Study

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Background: Limited research data exist regarding the role of perineural blockade of the distal median, ulnar, and radial nerves as a primary anesthetic in patients undergoing hand surgery.

Methods: Patients scheduled for hand surgery with a peripheral nerve block were randomized to receive either an ultrasound-guided supraclavicular, infraclavicular, or axillary nerve block (proximal blocks) or ultrasound-guided median, ulnar, and radial nerve blocks performed at the level of the mid to proximal forearm (forearm blocks). A sham block was also performed in an attempt to blind enrollees. The ability to undergo surgery without analgesic or local anesthetic supplementation or conversion to general anesthesia was the primary outcome. Block procedure times, postanesthesia care unit length (PACU) of stay, instances of nausea/vomiting, need for narcotic administration, and placement of a sling prior to discharge were also assessed.

Results: There was no difference between the forearm and proximal block groups in terms of the need for conversion to general anesthesia or analgesic or local anesthetic supplementation. No differences were noted in surgical duration or tourniquet times. Both groups reported similarly low numerical rating scale (NRS) pain scores with no differences in the need for postoperative analgesic administration. Block procedure characteristics were similar between the 2 groups.

Conclusion: Forearm blocks may be safely used as a primary anesthetic in patients undergoing hand surgery. While it is unknown if their motor-sparing properties result in improved patient safety or satisfaction, the lack of a need for a sling presents a cost-savings opportunity for providers and institutions.

Table. Primary and Secondary Outcome Measures

Variable	Forearm Block Group (n=30)	Proximal Block Group (n=30)	P Value
Block used as the primary anesthetic, n (%)	29 (96.7)	28 (93.3)	NS
Conversion to general anesthesia or local anesthetic supplementation by the surgical team, n (%)	1 (3.3)	2 (6.7)	NS
NRS score >0 upon arrival, n (%)	2 (6.7)	1 (3.3)	NS
NRS score >0 one hour postprocedure, n (%)	2 (12.5)	1 (5.3)	NS
Median PACU length of stay, minutes [IQR]	61 [53.7-70.3]	61.5 [45.8-67.3]	NS
Nausea in PACU, n (%)	1 (3.3)	1 (3.3)	NS
Need for opioid administration in PACU, n (%)	2 (6.7)	1 (3.3)	NS
Numbness or tingling at 24-48 hours, n (%)	12 (42.9)	7 (25.9)	NS
Evidence of nerve injury at 7-10 days, n (%)	0 (0)	1 (3.3)	NS

33 The Elephant in the Room: The Increased Incidence of Neurological Deficits With Carotid Endarterectomy vs Protected Carotid Stenting in Randomized Controlled Trials

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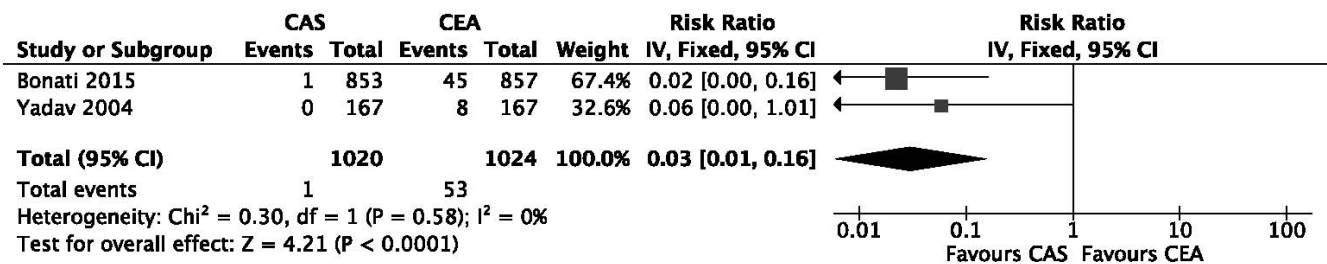
Background: In randomized controlled trials (RCTs), approximately 5% of patients have a significant cranial nerve injury that affects their quality of life scores following carotid endarterectomy (CEA). Recent data have demonstrated that these deficits persist for more than 1 month in two-thirds of patients and more than 1 year in one-fifth of patients. These injuries are at least as disabling as a minor stroke. The epidemiology of cranial nerve injuries from CEA is of interest to clinicians and their patients being evaluated for CEA.

Methods: All RCTs comparing CEA and protected carotid stenting (CAS) were evaluated to compare the short-term incidence of major stroke, total neurological deficits including any stroke and cranial nerve injury, myocardial infarct (MI), and death. We used Revman v.5.3 software for statistical analysis. When $I^2 < 25\%$, fixed effect analysis was used; otherwise, random effect analysis was used.

Results: Major stroke and death were similar in both procedures but total neurological deficits and myocardial infarction were significantly more common in CEA. Specifically, the risk ratio (RR) for any neurological deficits was 32% lower among CAS patients compared to CEA patients (Figure; RR 0.68 CI 95% 0.50-0.92, $P=0.01$).

Conclusion: RCTs data have demonstrated that CEA and CAS are similar with regard to the incidence of death or major stroke. However, CEA is more likely to result in neurological deficits defined as stroke or cranial nerve injury.

Facial Nerve Palsy



34 Long-Term Follow-Up Metaanalysis of Carotid Stenting vs Endarterectomy: Different Procedures With a Similar Safety Profile

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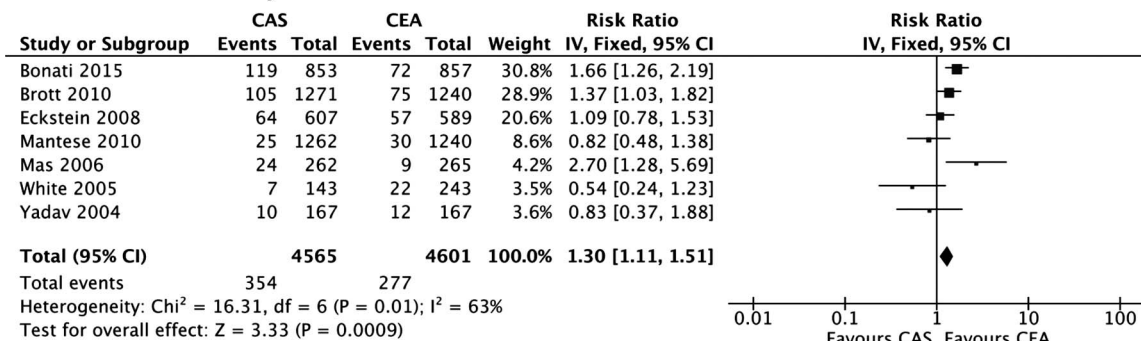
Background: Carotid stenting (CAS) and carotid endarterectomy (CEA) are strategies utilized to decrease the incidence of stroke among patients with atherosclerotic carotid artery stenosis, especially for symptomatic patients. In the short term, CAS has a higher incidence of minor stroke, while CEA has a higher incidence of cranial nerve palsy and myocardial infarction. Long-term efficacy data regarding these strategies are now available.

Methods: We evaluated all randomized controlled trials (RCTs) comparing CEA and protected CAS with at least 12 months of follow-up to analyze the long-term incidence of any stroke, major stroke, and death. Statistical analysis was performed with Revman v.5.3 software. When $I^2 < 25\%$, fixed effect analysis was used; otherwise, random effect analysis was used.

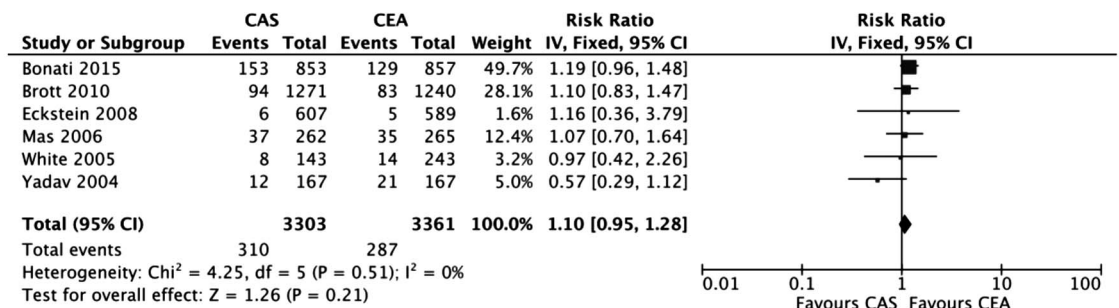
Results: The risk ratios for any stroke, major stroke, and death were similar. The results remained unchanged when the analysis was limited to RCTs including only symptomatic patients.

Conclusion: In this metaanalysis of RCT data, CAS and CEA had a similar incidence of stroke and death during long-term follow up.

All Cause Mortality



Any Stroke



35 Triple Antithrombotic Therapy in Patients With Left Ventricular Assist Devices: A Single-Center Experience

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Background: Data on the efficacy and safety of dual antiplatelet therapy (DAPT) compared with mono antiplatelet therapy (MAPT) in patients with left ventricular assist devices (LVADs) remain scarce.

Methods: In this single-center study of 101 consecutive durable continuous flow LVAD patients on warfarin, baseline demographics, antiplatelet regimen, and outcomes were compared between patients receiving DAPT (Group 1) and MAPT (Group 2). Antiplatelet therapy at hospital discharge included aspirin, clopidogrel, and dipyridamole. Outcomes at 1-6 months and at 6-12 months were assessed.

Results: No significant differences in age, sex, or ethnicity were noted between the groups. Group 1 was more likely to have a history of hyperlipidemia and stroke/transient ischemic attack. At 6 months, nonstatistically significant higher rates of bleeding and lower rates of ischemic stroke and pump thrombosis were noted in Group 1 (bleeding: Group 1=29.03% vs Group 2=25.47%, $P=0.789$; gastrointestinal bleed: Group 1=21.05% vs Group 2=20.68%, $P=0.969$; ischemic stroke: Group 1=3.84% vs Group 2=0%, $P=0.311$; hemorrhagic stroke: Group 1=1.96% vs Group 2=7.14%, $P=0.249$; pump thrombosis: Group 1=4.34% vs Group 2=12%, $P=0.229$). Between 6-12 months, no significant differences in bleeding (Group 1=23.80% vs Group 2=28.57, $P=0.604$); gastrointestinal bleed (Group 1=13.11% vs Group 2=14.28, $P=0.872$); ischemic stroke (Group 1=4.92% vs Group 2=2.85%, $P=0.627$); hemorrhagic stroke (Group 1=1.61% vs Group 2=0%, $P=0.45$); or pump thrombosis (Group 1=12.24% vs Group 2=9.67%, $P=0.723$) were found.

Conclusion: Our study showed a high prevalence of DAPT in LVAD patients with no significant differences in bleeding, stroke, or pump thrombosis compared to patients receiving MAPT.

36 Telemetry Overusage and Its Economic Implications

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Background: Healthcare expenditures in the United States far exceed those of any other nation, and efforts are needed to contain the rising costs. Cardiac telemetry is costly and may be overused. Reduction of unnecessary telemetry may be a way to reduce costs.

Methods: Using the electronic medical record at our urban, tertiary-care teaching hospital with 473 beds, we reviewed the records of 250 consecutive patients admitted to telemetry-capable beds on noncardiology, noncritical care units. Based on the American Heart Association (AHA) Practice Standards for Electrocardiographic Monitoring in Hospital Settings, telemetry use was graded as appropriate or inappropriate. We assessed significant new arrhythmias, code calls, and clinical decisions (eg, medication changes and cardiology consults) resulting from telemetry. Cost of a telemetry day was calculated using a time-driven activity-based cost model.

Results: The 250 patients (mean age of 63 ± 19 years, 54% male) spent a total of 1,642 days hospitalized, and 1,402 (85%) were on telemetry. Average length of stay was 6.6 days, and average time on telemetry was 5.6 days. Based on AHA Practice Standards, 319 (23%) telemetry days were deemed appropriate. During telemetric monitoring, 16 new significant arrhythmias were detected (all during appropriate telemetry days), 4 code calls were made (all respiratory arrests, 1 [25%] on an inappropriate telemetry day), and 19 significant clinical decisions were made (only 1 [5%] on an inappropriate telemetry day). No code call occurred on a nontelemetry day. Cost of telemetry was calculated as \$34.28 more per day than a nontelemetry bed. Elimination of inappropriate telemetry days would have resulted in estimated savings of \$37,007 in these 250 patients and an annual savings of \$528,241 overall.

Conclusion: Telemetric monitoring is overused among patients admitted to noncardiac, noncritical care services at a tertiary-care hospital. A reduction in inappropriate telemetry days in accordance with the AHA Practice Standards would result in significant savings.

37 Variations in Response to Cardiac Rehabilitation and Outcomes

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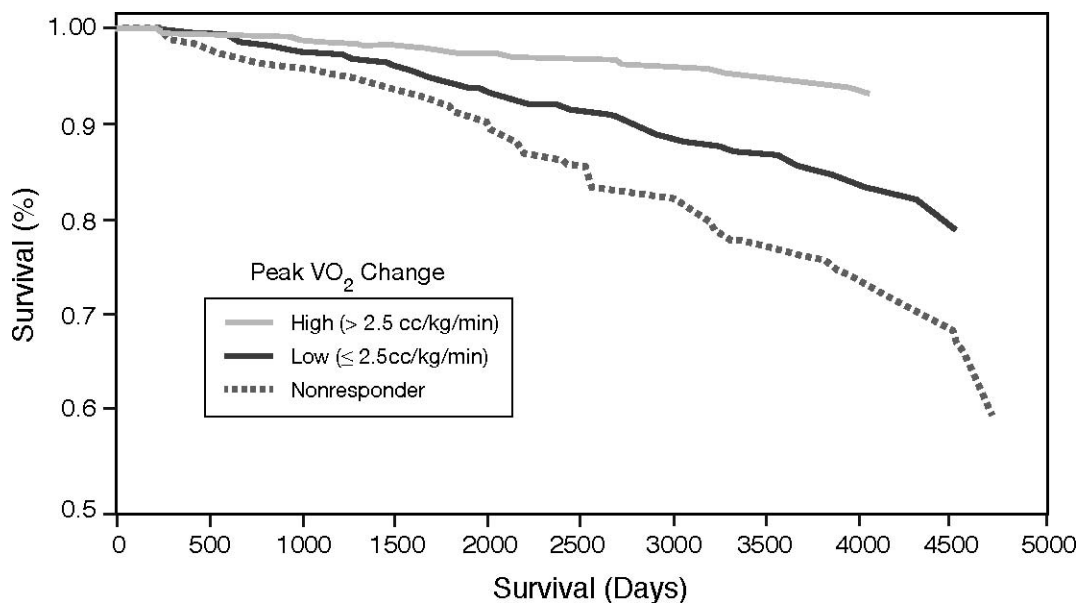
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Background: Studies of coronary heart disease (CHD) and cardiac rehabilitation (CR) have traditionally focused on the mortality benefit of CR and on increasing enrollment. However, not all patients improve equally with CR. We examined the prognosis and characteristics of patients who enrolled in and completed CR, stratified by their level of improvement in exercise tolerance (ET).

Methods: A total of 1,171 CHD patients who underwent CR with cardiopulmonary stress testing (CPX) before and after were divided according to absolute improvements in ET measured by peak oxygen consumption on CPX. Those who did not improve were designated nonresponders (NonRes), subjects who improved <50th percentile were designated as low responders (LowRes; ≤ 2.5 cc/kg/min improvement), and the rest were designated high responders (HighRes). Mortality was analyzed after 6-161 months of follow-up (mean 6.4 years).

Results: A total of 266 (23%) of subjects were NonRes. After adjustment for body mass index, age, sex, ejection fraction, and baseline ET, patients in the LowRes group had a statistically significant 2-fold increase in mortality, and patients in the NonRes group had a near 4-fold increase in mortality compared to patients in the HighRes group (Figure). Higher age, female sex, higher baseline ET, presence of depression, and greater waist circumference were significantly associated with being NonRes.

Conclusion: A significant proportion of subjects referred to CR have no improvement in ET and have associated poor prognosis. Higher absolute gains in ET are associated with increased survival. Further investigation into the identifying characteristics of this population is needed to determine if their prognosis can be altered.



38 The Impact of Depression, Anxiety, Hostility, and Combined Psychosocial Stress on Mortality After Cardiac Rehabilitation

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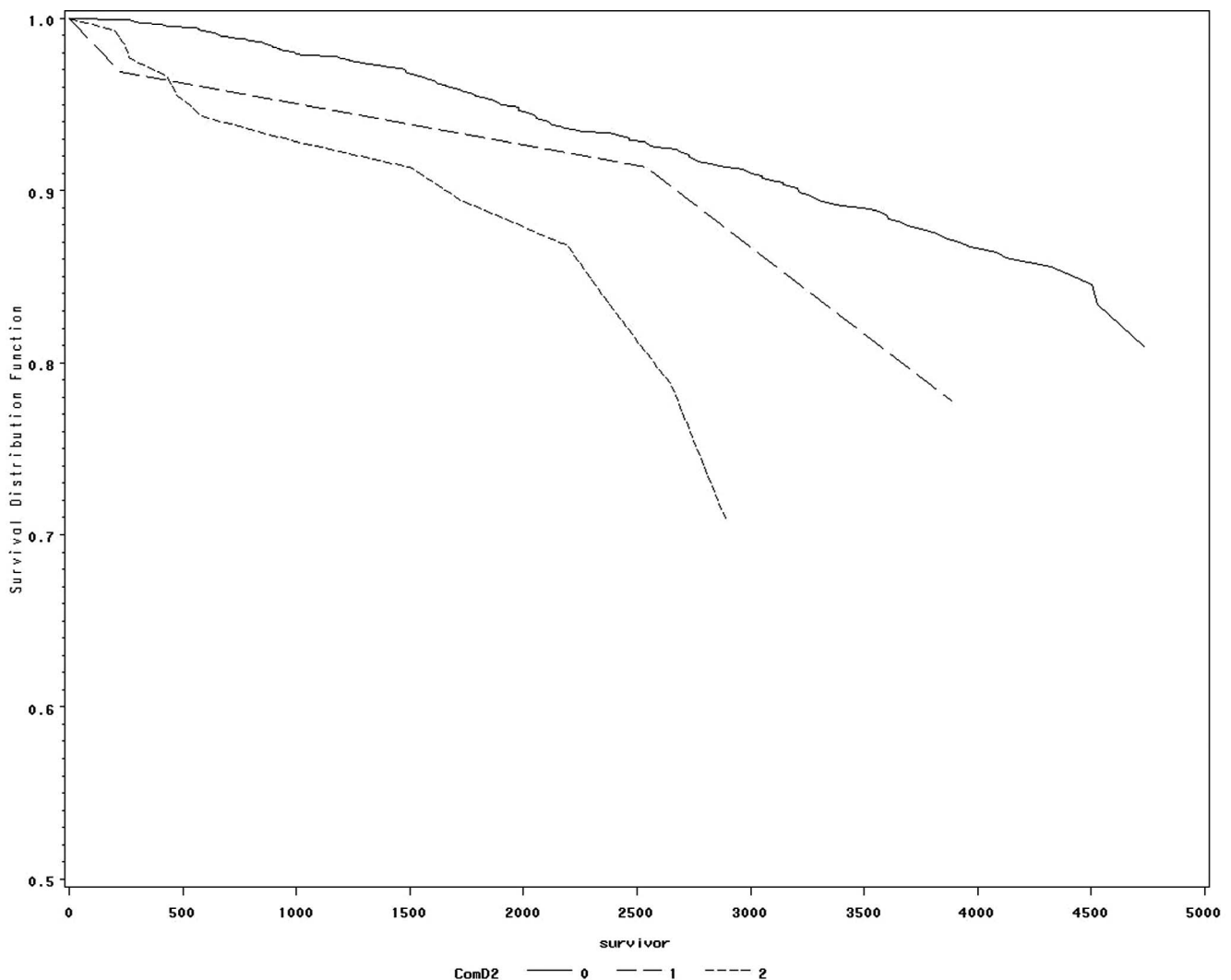
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Background: Depression has been associated with mortality in stable coronary heart disease (CHD). However, it is unknown if other forms of psychosocial stress confer an additional mortality disadvantage when combined with depression. Therefore, we evaluated the incremental effects of anxiety, hostility, and total psychosocial stress (PSS; combined scores for depression, anxiety, and hostility) when combined with depression in a large cohort of patients with stable CHD.

Methods: We studied 1,157 patients with CHD following major CHD events who had completed formal cardiac rehabilitation (CR). Using Kellner questionnaires, patients' level of stress was measured in one of 3 domains—anxiety, hostility, and depression (with an aggregated overall PSS score)—and divided into 3 groups: nondepressed ($n=1,079$), depression alone ($n=18$), and depression with anxiety or hostility ($n=60$). Subjects were analyzed by all-cause mortality during 1-161 months of follow-up (mean 6.4 years) by National Death Index.

Results: Depression after CR was not common (6.7%; mortality 16.6%) but when present, frequently was associated with either anxiety or hostility (77%; mortality 21.6%). After adjustment for age, sex, ejection fraction (EF), and peak oxygen consumption, higher levels of anxiety, depression, PSS, and number of psychosocial comorbidities (Figure) were associated with mortality (hazard ratio [HR] 1.05 [$P=0.02$]; HR 1.05 [$P=0.04$]; HR 1.02 [$P=0.05$]; and HR 1.26 [$P=0.04$], respectively) in the entire population.

Conclusion: Depression is usually associated with other forms of stress, and it seems to confer an additional mortality disadvantage, even after CR. Additional efforts should focus on addressing PSS that persists after CR.



39 Examining Outcomes for Absolute vs Relative Increases in Oxygen Consumption After Cardiac Rehabilitation

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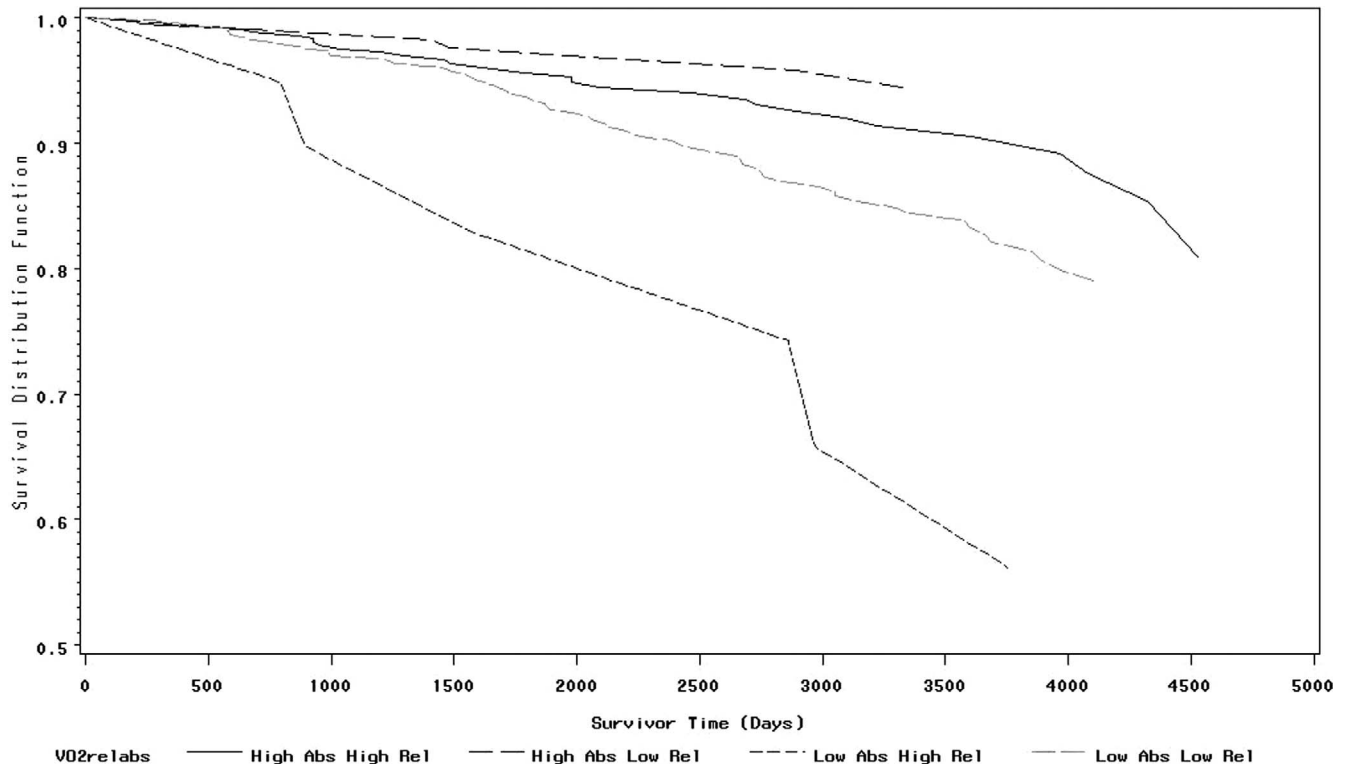
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Background: In stable coronary heart disease (CHD), cardiac rehabilitation (CR) has been shown to improve mortality commensurate with levels of improvement in cardiorespiratory fitness (CRF). We examined whether relative improvement is as important as absolute improvement in terms of mortality.

Methods: A total of 890 subjects with stable CHD referred for CR were stratified according to baseline peak oxygen consumption (VO₂) and post-CR improvement in VO₂ (absolute group divided at 2.5 cc/kg/min; relative group divided at 20%) measured during maximal cardiopulmonary exercise testing.

Results: After adjusting for age, sex, left ventricular ejection fraction, baseline VO₂, and body mass index, participants with higher absolute improvement in VO₂ had a 2-fold lower mortality (hazard ratio [HR] 0.56, *P*<0.001), whereas high relative improvement had no significant mortality effect. High relative improvement without high absolute improvement was independently associated with increased mortality (HR 2.63, *P*<0.001, Figure) and lower baseline fitness (*P*<0.001) compared to groups with high absolute improvement.

Conclusion: In patients with CHD, there is an improvement in mortality with higher absolute increases in VO₂ regardless of baseline CRF or relative changes in fitness. High relative changes without associated absolute improvement are indicative of an especially low baseline CRF and high mortality risk. This may indicate that patients should be encouraged to set absolute targets for improvement in exercise capacity to improve outcomes.



40 Increased Fitness Modifies the Obesity Paradox by Body Composition Even in Individuals With Low Cardiorespiratory Fitness

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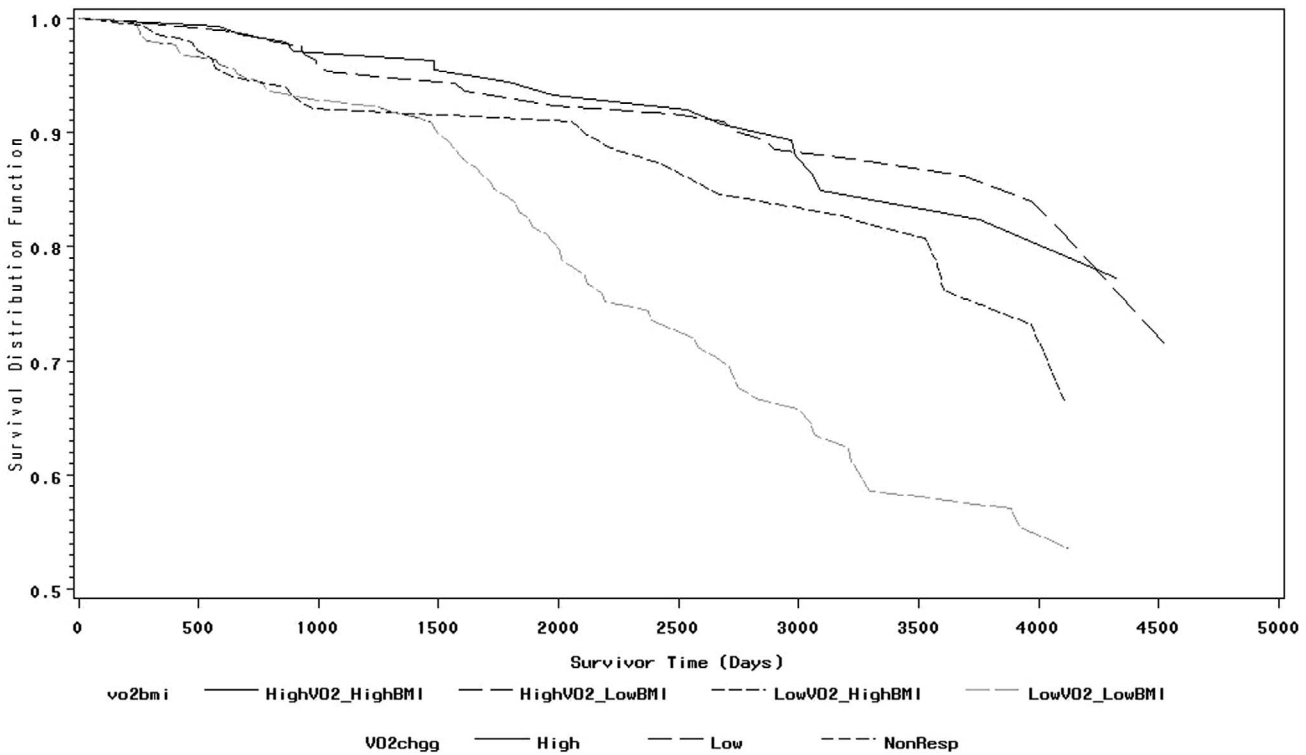
Background: An association between obesity and increased survival has been shown in patients with stable coronary heart disease (CHD), especially in individuals with low cardiorespiratory fitness (CRF). We examined the impact of fitness improvement on this paradoxical relationship.

Methods: A total 588 subjects with stable CHD referred for cardiac rehabilitation with CRF (<17 cc/kg/min peak oxygen consumption [VO₂]) were stratified based on their degree of improvement in CRF. Mortality from the cohort was analyzed with respect to body mass index (BMI), body fat (BF), and lean mass index (LMI).

Results: In all subjects, higher BMI, BF, and LMI were associated with significant protective effects after adjusting for age, sex, left ventricular ejection fraction, and baseline VO₂ (hazard ratio [HR] 0.5, *P*=0.01; HR 0.60, *P*=0.006; HR 0.20, *P*<0.001, respectively). In a subgroup that comprised the top 50th percentile of VO₂ improvement, obesity by BMI and BF was no longer associated with improved survival (HR 0.75, *P*=0.4 for BMI and HR 0.83, *P*=0.6 for BF, Figure), but increased lean mass continued to be protective (HR 0.2, *P*<0.001).

Conclusion: Persons with low baseline CRF who have significant improvement in absolute VO₂ continue to have survival benefits from increased LMI but not from increased BF and BMI. The obesity paradox by BF may be limited to those individuals with low CRF who fail to improve after CR.

The SAS System



41 Association of Blood Types With Bleeding and Thromboembolic Events in Patients Receiving Continuous Flow Left Ventricular Assist Devices

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Background: Acquired von Willebrand (vW) syndrome is a well-recognized entity among patients receiving continuous flow left ventricular assist devices (CF-LVADs). Additionally, patients with blood type O have lower levels of vW factor and factor VIII compared to patients with other blood types. Consequently, we hypothesized that blood type affects the risk of thromboembolic and bleeding events in patients with CF-LVADs.

Methods: In this retrospective single-center study of 150 patients supported with a CF-LVAD, baseline characteristics, vW factor and factor VIII, bleeding, stroke, and LVAD thrombosis rates were compared among blood types.

Results: Prior to LVAD implantation, vW factor and factor VIII testing were performed in 96 consecutive patients. Compared to patients with other blood types, patients with blood type O had lower levels of vW antigen (Type O: 175.62 ± 67.67 , Type A: 275.61 ± 123.53 , Type B: 241.75 ± 64.18 , Type AB: 331.75 ± 77.6 ; $P=0.001$), vW factor activity (Type O: 131.33 ± 48.88 , Type A: 213.53 ± 93.30 , Type B: 192.71 ± 44.09 , Type AB: 204.67 ± 34.7 ; $P=0.003$), and factor VIII assay (Type O: 199.1 ± 61.67 , Type A: 259.65 ± 94.92 , Type B: 226.13 ± 34.01 , Type AB: 279 ± 58.92 ; $P=0.006$). At 1 year, no statistically significant differences in bleeding (Type O=27.45% vs non-O type=25.64%, $P=0.847$), stroke (Type O=7.55% vs non-O type=2.56%, $P=0.297$), or pump thrombosis (Type O=9.43% vs non-O type=7.14%, $P=0.690$) were found between blood types.

Conclusion: Despite lower levels of vW factor and factor VIII in patients with blood type O, no significant differences in event rates were found compared to patients with other blood types.

Table. Baseline Characteristics: Blood Type O vs Non-O Blood Type

Variables	Overall Cohort (n=96)	Blood Type O (n=53)	Non-O Blood Types (n=43)	P Value
Gender, males %	75	67.92	83.72	0.098
Age	53.53 ± 12.52	54.09 ± 11.34	52.84 ± 13.94	0.627
Ethnicity				0.420
Whites	51.04	47.16	55.81	
Blacks	48.96	52.83	44.18	
BMI	30.37 ± 5.54	30.42 ± 6.16	30.30 ± 4.72	0.917
Ischemic Cardiomyopathy	42.70	43.39	41.86	0.88
HTN	82.29	86.79	76.74	0.283
Hyperlipidemia	62.31	52.83	34.88	0.079
CAD	51.04	52.83	48.83	0.697
CABG	3.12	3.77	2.32	0.685
ICD	89.58	92.45	86.04	0.307
CVA/TIA	16.66	13.20	20.93	0.313
DM	40.62	39.62	41.86	0.824
Atrial fibrillation	30.20	26.41	34.88	0.369
CKD GFR<60	11.11	34.61	28.94	0.566
HM II	89.6	84.90	95.34	0.096
HM II speed	9041.86 ± 287.98	9004.44 ± 250.41	9082.93 ± 322.41	0.209
HVAD speed	2658.0 ± 178.0	2697.50 ± 170.19	2500.0 ± 141.42	0.173
Factor VIII assay	221.78 ± 74.53	199.09 ± 61.67	253.69 ± 80.13	0.001
VW antigen	213.97 ± 97.07	175.62 ± 67.67	274.07 ± 106.36	<.0001
WWF activity	159.37 ± 70.79	131.33 ± 48.88	207.15 ± 77.34	<.0001
Homocysteine	14.40 ± 5.60	13.24 ± 5.17	16.34 ± 5.88	0.044
Fibrinogen	428.05 ± 122.17	421.53 ± 124.09	437.63 ± 120.61	0.569
Antithrombin III	96.03 ± 19.12	100.47 ± 16.20	88.70 ± 21.55	0.018
Na	135.01 ± 3.48	135.50 ± 3.27	134.36 ± 3.68	0.122
Creatinine	1.16 ± 0.44	1.15 ± 0.36	1.16 ± 0.54	0.962
Total Bilirubin	1.17 ± 1.01	1.14 ± 1.16	1.20 ± 0.79	0.772
Albumin	3.04 ± 0.55	3.13 ± 0.54	2.92 ± 0.54	0.073
AST	37.13 ± 38.71	27.75 ± 28.39	49.64 ± 46.76	0.007
ALT	34.04 ± 37.25	21.44 ± 14.43	50.85 ± 50.00	<.0001
HGB	10.85 ± 2.38	11.10 ± 2.49	10.51 ± 2.22	0.254
BNP	811.36 ± 893.52	729.02 ± 777.85	919.71 ± 1027.02	0.324

Continuous variables are expressed with mean ±SD. Categorical variables are expressed in percentage (%).

BMI, body mass index; HTN, hypertension; CAD, coronary artery disease; CABG, coronary artery bypass graft; ICD, implantable cardiac defibrillator; CVA/TIA, cerebrovascular accident/transient ischemic attack; DM, diabetes mellitus; NA, sodium; AST, aspartate aminotransferase; ALT, alanine aminotransferase; HGB, hemoglobin; BNP, b-type natriuretic peptide; CKD, chronic kidney disease; GFR, glomerular filtration rate; HM II, heartmate II.

42 Effect of Heart Rate Correction on the T-peak to T-end Interval's Risk Stratification Ability

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Background: The T-wave peak to T-end interval (Tpe) has been shown to predict ventricular tachyarrhythmia (VT/VF) and/or death in several patient populations. Some investigators have applied heart rate (HR) correction to Tpe, most often using the Bazett method, although other methods exist. The effect of HR correction method on the predictive ability of Tpe is unknown.

Methods: We followed patients with left ventricular ejection fraction (LVEF) ≤35% and a primary prevention implantable cardioverter-defibrillator. Tpe was measured using 2 methods: the manual tangent method in V₂, and the automatic 12SL method. HR correction was applied using the methods of Bazett (QT/RR^{0.5}), Fredericia (QT/RR^{0.33}), Framingham (QT+0.154*[1000-RR]), and Hodges (QT+105*[1/RR-1]). Patients were prospectively followed for VT/VF and death.

Results: A total of 305 patients (mean age 70 ± 11 years, 73% male, mean LVEF 23% ± 7%) were analyzed. During 30 ± 23 months of device follow-up, 93 (28%) patients had VT/VF, and during 50 ± 21 months of clinical follow-up, 99 (30%) patients died. As seen in the Table, uncorrected Tpe did not predict VT/VF (P≥0.1), but following correction for HR using any established method, Tpe_c predicted VT/VF (all P≤0.02). For VT/VF, Tpe_c using the Framingham or Hodges correction method yielded higher hazard ratios than Tpe_c using the Bazett or Fredericia method. All corrected and uncorrected Tpe methods predicted death (all P≤0.03), except uncorrected 12SL (P=0.12).

Conclusion: Regardless of measurement method (V₂ or 12SL), the ability of Tpe to predict VT/VF is dependent upon HR correction. Among HR correction methods, the Framingham and Hodges methods appear to improve prediction more than the methods of Bazett and Fredericia. The ability of Tpe to predict death is not as dependent upon HR correction.

Table.

Heart Rate Correction Method	T-peak to T-end Measurement Method	VT/VF			Mortality		
		Hazard Ratio per Standard Deviation	Confidence Interval	P	Hazard Ratio per Standard Deviation	Confidence Interval	P
Uncorrected	V ₂	1.12	0.91 – 1.37	0.27	1.20	1.02 – 1.42	0.03
	12SL	1.20	0.97 – 1.48	0.10	1.17	0.96 – 1.44	0.12
Bazett	V ₂	1.34	1.10 – 1.63	<0.01	1.29	1.09 – 1.53	<0.01
	12SL	1.51	1.19 – 1.91	<0.01	1.30	1.04 – 1.62	0.02
Fredericia	V ₂	1.25	1.03 – 1.52	0.02	1.25	1.06 – 1.47	<0.01
	12SL	1.40	1.12 – 1.76	<0.01	1.26	1.02 – 1.55	0.03
Framingham	V ₂	1.68	1.34 – 2.11	<0.001	1.37	1.11 – 1.69	<0.01
	12SL	1.67	1.23 – 2.24	<0.001	1.31	1.04 – 1.64	0.02
Hodges	V ₂	1.55	1.26 – 1.90	<0.001	1.36	1.12 – 1.66	<0.01
	12SL	1.60	1.28 – 1.99	<0.001	1.30	1.05 – 1.61	0.02

43 Step 1 Delay: A Step in the Wrong Direction?

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Background: The US Medical Licensing Examination Step 1 is the single most important factor in determining a medical student's competitiveness in the US National Resident Matching Program. The policy at The University of Queensland, Ochsner Clinical School allows for the deferral of the Step 1 examination. This study was designed to compare the academic performance of students taking the examination prior to the start of the third year of medical school with those who delayed the examination.

Methods: All students taking the Step 1 examination from the start of the program in 2009 through May 21, 2015 were grouped according to their timing in sitting for the examination. Students whose examination date was later than the start of their third year were defined as delaying the examination. Those who took the examination prior to their third year were defined as taking the examination on time. We compared Step 1 mean scores and failure rates between these groups.

Results: A total of 49/207 (24%) students delayed the examination. The mean Step 1 score was 224.7 for those who took the examination on time and 214.9 for those who delayed the examination ($P < 0.01$, 2-tailed t test). The Step 1 failure rate was 7.0% for those who took the examination on time and 16.3% for those who delayed it ($P = 0.018$, chi-square). Additionally, all 5 students who failed to match during this period had delayed the examination.

Conclusion: Delay in taking the Step 1 examination is associated with worse performance on the Step 1 examination, including a lower mean test score and a higher first-time failure rate. Students who delay taking Step 1 may be at high risk, as no student who took the examination on time failed to match. Additional research is necessary to determine if a causal relationship exists.

44 Obesity Management in Primary Care Within Ochsner Health System

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Background: Obesity is a costly public health problem that has reached epidemic proportions with two-thirds of the US population being overweight/obese. Given the high rates of obesity in Louisiana, the Ochsner Health System, as the largest healthcare provider in the state, is uniquely positioned to set the standard for obesity management. Our study objectives were to assess factors associated with obesity management in primary care at Ochsner and identify care gaps amenable to quality improvement.

Methods: This retrospective observational study examined data from adults seen in Ochsner primary care clinics at least twice between July 2014 and December 2015 and who had a body mass index (BMI) ≥ 30 . From the electronic medical record (EMR), we extracted patient vital signs, demographics, primary care encounters, diagnoses, and orders (weight loss medications, referral to nutrition/fitness counseling or bariatric medicine/surgery). We conducted a multivariate analysis to examine factors associated with ordering obesity care management.

Results: The Table shows the results of the EMR review. Primary care served 75,175 patients during 283,506 encounters. Overall rates of prescribing weight-loss medications and ordering nutrition/fitness counseling or bariatric medicine/surgery were low. The odds of ordering these services increased with female gender, insurance type, number of chronic conditions, higher BMI, and linking the diagnosis of obesity to encounters. Older age decreased the odds of ordering these services. Race was not consistently associated with ordering obesity management.

Conclusion: We observed gaps of care in obesity management within a large primary care population. Future research should examine whether EMR documentation patterns reflect gaps in provider knowledge/practice patterns, limitations in reimbursement for obesity management, geographic differences in resources, or patient preferences for care.

Table. Retrospective Review of Obesity Management in Primary Care

Characteristics of patients	BMI 30-35.9 (n=39835)	BMI 36-40.9 (n=16237)	BMI ≥41 (n=19103)
Age, <65	25844 (65%)	11564 (71%)	15115 (79%)
Gender, female	21936 (55%)	10079 (62%)	13257 (69%)
Race, White	26494 (67%)	10167 (63%)	11003 (58%)
Race, African American	12825 (32%)	5880 (36%)	7897 (41%)
Insurance, Commercial	24522 (62%)	10620 (65%)	13183 (69%)
Diabetes	10611 (27%)	5309 (33%)	7047 (37%)
Hypertension	23654 (59%)	10449 (64%)	12727 (67%)
Hyperlipidemia	17860 (45%)	7186 (44%)	7559 (40%)
Obstructive sleep apnea	2712 (7%)	1834 (11%)	3398 (18%)
Obesity linked to encounter	7955 (20%)	5345 (33%)	2170 (11%)
Weight loss meds prescribed	1481 (4%)	1171 (7%)	2170 (11%)
Lifestyle counseling	2435 (6%)	1483 (9%)	2783 (15%)
Bariatric Medicine/Surgery	113 (0.2%)	194 (1%)	1064 (6%)
Factors associated with ordering obesity management (OR, 95% CI)	Meds	Lifestyle Counseling	Bariatric MedSurg
Age, ≥65 vs <65	0.4 (0.4-0.5)	0.7 (0.6-0.7)	0.4 (0.3-0.5)
Gender, female vs male	2.2 (2.1-2.4)	1.3 (1.3-1.4)	1.2 (1.1-1.4)
Race, White (reference)
Race, African American	1.0 (0.9-1.1)	1.4 (1.3-1.5)	0.9 (0.8-1.1)
Race, Other minorities	0.7 (0.5-1.0)	1.4 (1.1-1.9)	1.1 (0.6-2.0)
Insurance, Self Pay/Other (reference)
Insurance, Medicaid	1.7 (1.2-2.2)	2.7 (2.0-3.7)	6.0 (2.8-12.6)
Insurance, Medicare	1.1 (0.9-1.4)	2.8 (2.2-3.7)	5.8 (2.9-11.9)
Insurance, Commercial	2.0 (1.5-2.5)	2.8 (2.2-3.7)	5.0 (2.5-10.2)
Number chronic conditions	1.2 (1.2-1.3)	1.4 (1.2-1.4)	1.3 (1.3-1.4)
Obesity linked to encounter	1.9 (1.8-2.1)	1.3 (1.2-1.4)	2.2 (1.9-2.5)
BMI, 30-35.9
BMI, 36-40.9	1.2 (1.1-1.3)	1.3 (1.2-1.4)	3.2 (2.5-4.0)
BMI, ≥41	1.5 (1.4-1.6)	1.8 (1.2-1.4)	11.7 (9.6-14.3)

Medications: Qysmia, Contrave, Belviq, Adipex, Orlistat, Saxenda, Didrex, Bontril, Tenuate.
 Bold font indicates $P < 0.05$.

45 Research Consent Form Readability

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Background: Informed consent is an ongoing process that starts with an approved informed consent form (ICF). Recently, ICFs and their templates have been found to have a higher Flesch-Kincaid reading grade level (RGL) score than the nationally recommended eighth grade reading level. This study attempted to elucidate whether study sponsor, phase, and approval year by the institutional review board (IRB) are associated with better ICF readability as measured by RGL scores in oncology studies.

Methods: All oncology studies approved by the IRB after January 1, 2010 and before March 1, 2015 were eligible for inclusion. Studies without a main ICF and those that did not contain a Health Insurance Portability and Accountability Act section were excluded. The RGL score for each study ICF was calculated using text analysis tools provided in Microsoft Word 2011. RGL scores were compared between sponsor (National Cancer Institute [NCI] vs private), study phase (I-IV), and approval year (2010-2015) for all studies with complete data using a multiple linear regression model.

Results: Of the 166 eligible oncology studies, 143 were included in the initial data analysis. The mean RGL scores of NCI-sponsored studies (9.85 ± 0.66) and of private entity-sponsored studies (10.72 ± 0.79) were significantly different ($P < 0.0001$). Also, the mean RGL scores for approval years 2011 (10.60 ± 0.76) and 2014 (10.43 ± 0.88) were significantly different ($P = 0.0279$ and $P = 0.0399$, respectively) from the mean RGL score of approval year 2010 (10.34 ± 0.79). Mean RGL scores for study phases and all other approval years were not significantly different.

Conclusion: This study found a strong association ($P < 0.0001$) between study sponsor and RGL scores in oncology studies. A systematic approach that targets specific sponsors could be beneficial in improving the readability of future oncology ICFs.

46 Research Innovations: Patient Response to a Novel, Tablet-Based Recruitment Process

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Background: In collaboration with the Research Action for Health Network (REACHnet), Ochsner Health System recently launched an innovative suite of mobile applications designed to recruit patients for clinical trials and research registries at the point of care.

Methods: In 2015, hand-held tablets were installed in 16 outpatient clinics across the Ochsner Health System and used to invite patients to self-enroll in the REACHnet patient network Health in Our Hands (HiOH) and complete a short health survey.

Results: In 10 months, 3,133 patients were recruited into HiOH, and 4,079 patients completed the health survey via the tablets. The average age of patients consenting into HiOH was 56 years (range, 19-97 years). The average age of patients who declined consent into HiOH was 57 years (range, 19-102 years). Male patients were less likely to consent into HiOH compared to females (odds ratio [OR]=0.968, $P = 0.022$), and minority patients were less likely to consent into HiOH compared to white patients (OR=0.765, $P < 0.001$).

Conclusion: Some challenges were encountered in integrating the use of the platform into the clinical workflow, but overall clinic staff response was positive. This process represents a promising method to embed clinical research within healthcare delivery systems and is an efficient, technology-assisted way to reach patients at the point of care. This recruitment method is currently being used for an ongoing clinical trial and will be used to recruit for a nationwide study beginning in summer 2016.

47 Interest in Internet or Smartphone Health Tracking Tools Among Older Patients

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Background: Health information technology such as patient portals, mobile tracking devices, and smartphone applications (apps) are increasingly promoted for chronic disease management and prevention. With the expanded use of these tools, elderly patients are particularly vulnerable for not experiencing benefits. This study examined factors among older adults associated with interest in websites/phone apps for tracking and managing their health.

Methods: We conducted a subanalysis of a cross-sectional survey of adults (stratified randomized sample of patients age ≥ 50 years with 2 or more primary care visits at Ochsner between 2012 and 2014) that assessed HIT use, e-health literacy (eHealth Literacy Scale [eHEALS], Single Item Literacy Scale [SILS]), and usefulness of MyOchsner patient portal features. The survey had 80% power to detect a 20% difference between portal users and nonusers in agreeing with eHEALS statements. We used multivariate analysis to examine whether demographics, literacy, internet/portal use, and number of comorbidities were associated with interest in using websites/apps.

Results: Among 217 respondents, the average age was 64 years; most were female, college educated, and self-reported hypertension (59%), arthritis (46%), or weight problems (38%). The Table shows the comparison between patients interested vs not interested in using websites/apps. Among those expressing an interest (n=147), >50% desired tools that provide medical information and help track exercise, diet, weight, blood pressure, and medications. In multivariate analyses, the odds of being interested in using websites/apps increased with e-health literacy (eHEALS score, odds ratio [OR] (95% CI) 1.2 [1.1-1.2]) and MyOchsner use (2.9 [1.3-6.6], all $P < 0.05$). Other factors were not significant predictors of interest.

Conclusion: E-health literacy may help identify patients who would benefit from prescribing mobile devices/website- s/phone apps for tracking and managing their health.

Table. Comparison of Patients Interested vs Not Interested in Using Website/Apps to Track or Manage Health

	Interested (n=147)	Not Interested (n=70)
Age (mean, SD)*	63.3 (6.9)	65.9 (7.5)
Gender, female	68%	68%
Number of chronic conditions (mean, SD)	2.7 (2.2)	3.0 (1.8)
College education	61.1%	45.6%
SILS, inadequate health literacy	10%	15%
Used the internet in last 3 months*	85%	57%
Total eHEALS score (mean, SD)*	30.7 (6.0)	23.5 (8.1)
MyOchsner user vs nonuser*	66%	26%
Interest in types of websites/apps*		
• Medical information	78%	...
• Exercise	60%	...
• Heart rate monitoring	49%	...
• Diet/Calorie count	55%	...
• Weight	61%	...
• Blood pressure	63%	...
• Blood sugar	40%	...
• Medication	57%	...
• Mood	42%	...
• Sleep	45%	...

Multivariate logistic regression examining factors associated with interest in websites/apps

Covariates of interest	OR (95%CI)
• Age	1.0 (0.9-1.1)
• Gender, female vs male	0.8 (0.3-1.8)
• Number of chronic conditions	1.2 (1.0-1.4)
• Education	
<high school	...
high school	1.4 (0.3-7.8)
college	0.9 (0.1-5.2)
graduate	0.3 (0.1-2.3)
• SILS, inadequate health literacy	1.3 (0.4-4.2)
• Used the internet in last 3 months	2.6 (0.9-8.1)
• Total eHEALS score*	1.2 (1.1-1.2)
• MyOchsner user vs nonuser*	2.9 (1.3-6.6)

*P<0.05.

48 Is There a Difference in Short-Term Outcomes When Colonic J-Pouch Anal Anastomosis Reconstruction Is Performed Following Laparoscopic vs Open Low Anterior Resection?

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Background: Various reconstruction techniques following low anterior resection (LAR) have been described with potential benefits attributed to a neo-reservoir creation. The purpose of this study was to compare the short-term outcomes of laparoscopic vs open colonic J-pouch anal anastomosis (CJPAA) reconstruction after LAR.

Methods: We identified patients who underwent either an open or laparoscopic LAR for rectal neoplasia followed by a CJPAA in the 2008-2013 American College of Surgeons National Surgical Quality Improvement Program database. A power analysis was performed with a total of 1,366 patients needed to provide an 80% power. Preoperative patient demographics, intraoperative data, and postoperative complications were compared. Bivariate analysis was performed to evaluate 30-day mortality, postoperative complications, and length of stay (LOS). Multivariate analysis was used to assess the impact of laparoscopic vs open reconstructive technique on postoperative complications.

Results: A total of 1,528 patients were included, 764 in the laparoscopic group and 764 in the open group. Preoperative characteristics, including age, diabetes, body mass index, American Society of Anesthesiologists physical status classification, and wound classification, were similar between groups. There was no difference in 30-day mortality (0.52% open vs 0.13% laparoscopic, $P=0.3$). Bivariate analysis demonstrated a shorter LOS (7.2 days vs 8.1 days, $P=0.001$), a lower rate of superficial surgical site infections (4% vs 11.2%, $P=0.001$), fewer postoperative transfusions (4.7% vs 9.8%, $P=0.001$), and a lower rate of postoperative myocardial infarction (0% vs 0.8%, $P=0.03$) in the laparoscopic vs open group. Operative time was longer in the laparoscopic vs open group (304 min vs 258 min, $P=0.0001$). Multivariate analysis did not demonstrate any difference in major complications between groups; however, laparoscopic CJPAA was associated with a lower rate of minor complications (7.7% vs 17.5%, $P=0.001$).

Conclusion: Laparoscopic LAR with CJPAA was associated with a shorter LOS and fewer minor complications compared to open LAR. CJPAA reconstruction is safe following both laparoscopic and open LAR for neoplasia.

49 Is Colonic J-Pouch Reconstruction Following Low Anterior Resection as Safe as Straight Anastomosis?

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Background: The purpose of this study was to compare the short-term morbidity and mortality of coloanal anastomosis utilizing a straight coloanal anastomosis (SCAA) vs colonic J-pouch anal anastomosis (CJPAA) for reconstruction after low anterior resection.

Methods: We identified patients who underwent proctectomy for rectal neoplasia followed by SCAA (CPT 45112) and CJPAA (CPT 45119) in the 2008-2013 American College of Surgeons National Surgical Quality Improvement Program database. Preoperative patient demographics, intraoperative data, and postoperative complications were compared. Univariate analysis was performed to evaluate 30-day mortality, postoperative complications, and length of stay (LOS). Multivariate analysis was used to assess the impact of the reconstruction technique on postoperative complications.

Results: A power analysis was performed for equality testing with a total of 1,366 patients needed to provide 80% power. A total of 1,471 patients were included in the analysis, 708 in the SCAA group and 763 in the CJPAA group. Preoperative characteristics including age, body mass index, American Society of Anesthesiologists physical status classification, and wound classification were similar between groups. There was no difference in 30-day mortality (0.8%). Univariate analysis demonstrated that major complications were higher in the SCAA group compared to the CJPAA group (20% vs 14%, $P=0.001$). In addition, LOS was longer in the SCAA group vs the CJPAA group (8.8 days vs 8.1 days, $P=0.001$), more deep surgical site infections occurred in the SCAA group (3.3% vs 1.4%, $P=0.03$), and the need for reoperation was increased in the SCAA group (7.8% vs 5.0%, $P=0.03$). After adjusting for covariates, major complications were equally as likely in both groups (odds ratio 0.68, 95% CI 0.46-1.00).

Conclusion: Despite the additional technical steps involved in colonic J-pouch reconstruction, postoperative complications were similar between CJPAA and SCAA. Additionally, an anastomosis utilizing a colonic J-pouch resulted in a shorter LOS.

50 Primary Anastomosis With or Without Proximal Diversion In Emergency Surgery For Diverticular Disease: Is There a Difference in 30-Day Outcomes?

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Background: Acute complications of diverticulitis include perforation and abscess. Although nonoperative treatments exist, some patients require emergency operation. Resection with primary anastomosis and proximal diversion is a safe alternative to a Hartmann procedure. We compared 30-day outcomes between patients treated with resection and primary anastomosis with and without proximal diversion.

Methods: The American College of Surgeons National Surgical Quality Improvement Program database was queried from 2005-2013 based on ICD-9 diagnoses of diverticular disease without bleeding with emergency surgery. CPT codes for laparoscopic and open colectomy, with and without proximal diversion, as well as ileostomy or cecostomy were queried.

Results: A total of 2,038 patients met the criteria. Of those, 1,912 had resection and primary anastomosis (Group 1), and 123 had resection and anastomosis with proximal diversion (Group 2). Group 1 included 905 males and 1,007 females. Group 2 included 64 males and 58 females. There was no difference in gender distribution; women were older in both groups ($P < 0.0006$). No differences in body mass index (29.1 vs 28.1, $P = 0.11$), preoperative albumin (3.3 vs 3.5, $P = 0.10$), preoperative hematocrit (35 vs 28, $P = 0.52$), white blood cell count (13.4 vs 13.7, $P = 0.54$), or functional status ($P = 0.71$) existed between the groups. Group 2 patients did not have higher American Society of Anesthesiologists physical status classification ($P = 0.14$) or wound class. Group 2 had a higher incidence of diabetes, chronic obstructive pulmonary disease, and smoking. Group 2 had longer operative times (133 vs 158 minutes, $P < 0.0001$). Postoperatively, there was no difference in surgical site infection (141 vs 7, $P = 0.76$), deep wound infection (36 vs 5, $P = 0.09$), organ space infection (124 vs 8, $P = 0.93$), septic shock (126 vs 3, $P = 0.18$), pulmonary embolism (20 vs 3, $P = 0.15$), cerebrovascular accident (7 vs 0, $P = 0.5$), myocardial infarction (15 vs 0, $P = 0.32$), length of stay (10 vs 8 days, $P = 0.11$), or death (88 vs 2, $P = 0.51$).

Conclusion: There is no difference in 30-day outcomes for patients undergoing emergency surgery for diverticular diseases regarding primary anastomosis with or without proximal diversion. Our data suggest a limited role for diversion if primary anastomosis is possible.

51 Agreement Between Patient-Reported and Cardiology-Adjudicated Medical History in Patients With Possible Ischemic Chest Pain

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Background: Obtaining an accurate medical history is essential in the assessment of patients, particularly for patients with acute chest pain because of the time imperative for diagnosis and commencement of treatment. We evaluated the reliability of patient-reported compared to physician-adjudicated medical history and the impact of disagreements on patient management in the acute setting.

Methods: A total of 776 patients presenting to the emergency department (ED) with suspected cardiac chest pain were recruited. Data collection included self-reported patient history, electrocardiogram testing, and troponin I measurement. Independent assessment of risk factors and medical history was adjudicated by cardiologists. Diagnosis of acute coronary syndrome (ACS) at 30 days after presentation was assessed. Cohen kappa statistical analysis was used to measure agreement. Cardiologist-adjudicated events were regarded as true in the assessment of accuracy.

Results: Thirty days after presentation, 83 participants (10.7%) were diagnosed with ACS. Previous coronary artery bypass grafting showed the highest agreement ($\kappa=1.00$) between patient-reported and cardiologist-adjudicated events, whereas prior ventricular arrhythmia ($\kappa=0.33$) showed the lowest agreement. Accuracy of reported prior congestive heart failure differed significantly between patients with and without diagnosed ACS at 30 days (92.8% vs 97.5%, respectively) (Table).

Conclusion: Agreement between patient-reported and cardiologist-adjudicated key medical history elements varied by historical components. Our study reinforces the importance of awareness of the limitations in obtaining accurate medical histories as discrepancies may influence risk stratification for ACS in the ED setting. Inability to obtain all relevant risk factors may contribute to delays in patient diagnosis and treatment. Our study reveals the importance of using electronic medical records and collateral history to acknowledge and address possible discrepancies and improve patient care.

Table. Patient-Reported and Cardiologist-Adjudicated Risk Factors, Cohen's Kappa, and Observed Accuracy

Medical History	Patient-Reported, n (%)	Cardiologist-Adjudicated, n (%)	Cohen's Kappa (95% CI)	% Observed Accuracy ($\pm 95\%$ CI)
Previous myocardial infarction	123 (16)	109 (14)	0.89 (0.84, 0.93)	97.16 (95.74-98.21)
Prior angina	170 (122)	137 (18)	0.71 (0.65, 0.78)	90.85 (88.60-92.79)
Prior ventricular arrhythmia	12 (2)	6 (1)	0.33 (0.04, 0.61)	98.45 (97.31-99.20)
Prior CAD	146 (19)	159 (20)	0.82 (0.77, 0.87)	94.20 (92.32-95.74)
Atrial arrhythmia	57 (7)	67 (9)	0.74 (0.65, 0.83)	96.13 (94.53-97.38)
Prior congestive heart failure	34 (4)	39 (5)	0.67 (0.54, 0.80)	97.04 (95.59-98.11)
History of cerebrovascular accident or TIA	58 (7)	39 (5)	0.64 (0.52, 0.75)	95.75 (94.08-97.05)
History of peripheral vascular disease	16 (2)	11 (1)	0.51 (0.28, 0.74)	98.32 (97.15-99.11)
Previous CABG	40 (5)	40 (5)	1.00 (1.00, 1.00)	100.00 (99.53-100.00)
Previous percutaneous coronary intervention	79 (10)	68 (9)	0.84 (0.78, 0.91)	97.29 (95.89-98.32)
History of rheumatoid arthritis	24 (3)	8 (1)	0.43 (0.21, 0.64)	97.68 (96.36-98.62)

CABG, coronary artery bypass graft; CAD, coronary artery disease; TIA, transient ischemic attack.

52 Distribution of Body Weight Changes With Canagliflozin in Patients With Type 2 Diabetes Mellitus

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53 Prevalence of Interval Colorectal Cancers at Ochsner Medical Center: Where Do We Stand?

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Background: An interval colorectal cancer is a cancer diagnosed prior to the recommended follow-up time from a previously negative colonoscopy. These cancers are thought to arise from a rapidly growing cancer, missed cancer, or incompletely resected adenomas. Our study aimed to identify interval cancers during a 4-year period. Our goal was to identify any potential risk factors associated with these cancers and to assess whether we are below the reported rates as mentioned in several current studies.

Methods: Our reference population included all patients who underwent colonoscopy for any indication between August 1, 2010, and July 31, 2014. Individuals younger than 18 years, those with a history of inflammatory bowel disease, and patients with a history of previously diagnosed colorectal cancer or known hereditary cancer syndrome were excluded from this population. A total of 28,794 colonoscopies were performed during this 4-year period. Through a retrospective review of our institution's electronic medical record and data from the state cancer registry, we identified patients who were diagnosed with colorectal cancer. From these individuals, we reviewed and selected those whose cancer was diagnosed prior to the recommended follow-up from a previous colonoscopy.

Results: Twenty individuals with interval cancers during a 4-year period were identified. The mean rate for the 4-year period was 0.07%. The mean patient age and time to diagnosis were 71 years and 40.2 months, respectively. Interval cancers were more common in the right colon (55%), and most were stage 4 (32%) by the time of diagnosis.

Conclusion: Our study demonstrated that the incidence of interval cancers is low, which supports an extremely effective cancer screening program. However, to further reduce the incidence of future interval cancers, it is crucial to pay close attention to the right colon.

54 Predictors of Hospitalization After Elective Endoscopic Variceal Ligation in Cirrhosis

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Background: Endoscopic variceal ligation (EVL) is the treatment of choice for esophageal varices in cirrhosis and reportedly carries a 3%-6% risk of bacteremia. Although antibiotics are strongly recommended for patients with active variceal bleeding, it is not known whether mortality and hospitalization rates after elective EVL may be improved using a similar approach.

Methods: This was a retrospective study (n=200) of all consecutive patients with cirrhosis who had elective EVL from January 2014 to August 2015. Information regarding mortality and hospitalization was recorded for 2 weeks after elective EVL.

Results: While no deaths occurred, 17 patients were hospitalized (8.5%). The rate of hospitalization in patients with and without ascites was 11.9% (15/126) and 2.7% (2/74), respectively ($P=0.03$). Most of the admissions (15/17) were patients with ascites. Among the patients with ascites, 2/17 (11.7%) on antibiotics (ABX) for prophylaxis of spontaneous bacterial peritonitis (SBP) were hospitalized vs 13/109 (11.9%) who were not on ABX for SBP prophylaxis ($P=NS$). A multivariate analysis to predict risk factors for hospitalization was conducted comparing age, sex, hepatic encephalopathy, serum albumin (ALB), creatinine, bilirubin, international normalized ratio, model for end-stage liver disease (MELD) score, immunosuppression, diabetes mellitus, and ABX for SBP prophylaxis. The analysis was significant for serum albumin only ($P=0.0002$).

Conclusion: No 2-week mortality or episodes of SBP after elective EVL were observed in this patient group. Ascites and low serum albumin appear to be predictors of hospitalization in patients with cirrhosis after elective EVL. This study does not support the use of routine prophylactic antibiotics in patients with cirrhosis undergoing elective EVL even in the presence of ascites.

Table. Baseline Characteristics of Study Group

Average Age, Years (range)	Sex, n (%)	Average MELD Score (range)	Etiology of Cirrhosis, n (%)	Ascites, n (%)
61 (26-81)	Male, 127 (63.5) Female, 73 (36.5)	11 (6-29)	NASH, 55 (27.5) Alcohol, 23 (11.5) Viral, 80 (40) Other, 41 (20.5)	Yes, 126 (63) No, 74 (37)

MELD, Model for End-Stage Liver Disease; NASH, nonalcoholic steatohepatitis.

55 Transcatheter Aortic Valve Replacement for Severe Aortic Stenosis as a Bridge to Liver Transplantation

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Background: Historically, severe aortic stenosis (AS) has been corrected surgically with aortic valve replacement. In patients with end-stage liver disease (ESLD), cardiac surgery and liver transplantation (LT), performed sequentially or simultaneously, have been associated with a high rate of morbidity and mortality. Thus, most patients with AS have been excluded from LT. Transcatheter aortic valve replacement (TAVR) has emerged as an alternative to high-risk cardiac surgery in patients with severe AS.

Methods: To examine the role of TAVR for severe AS in patients being considered for LT, we retrospectively reviewed the records of all patients with ESLD and severe AS who underwent TAVR between October 2011 and September 2015.

Results: Eight patients (6 male and 2 female) underwent TAVR for severe AS. Their mean age was 60.6 ± 6.3 years. Model for end-stage liver disease (MELD) scores ranged from 10-21 with a mean of 13.5 ± 3.6 . The mean postprocedure length of hospital stay was 2.6 ± 0.8 days. Procedural success was achieved in all cases. No life-threatening complications and no significant hepatic decompensation occurred. One patient developed left bundle branch block postprocedure but did not require pacemaker insertion. Another patient developed a perivalvular leak that was closed with a vascular plug. All patients had follow-up (median 16.5 months, range 2-49 months). Two patients underwent successful LT at 2 and 3 months after TAVR insertion. Three patients remained stable at 3, 38, and 49 months after TAVR insertion with MELD scores of 17, 12, and 10, respectively. Three late deaths at 16, 17, and 32 months occurred (2 for unknown causes and 1 with metastatic hepatocellular carcinoma).

Conclusion: This is the first report of successful LT in patients who have undergone TAVR for severe AS. The procedure is effective and safe in patients with ESLD. However, outcomes in patients with more advanced liver disease (MELD score >21) warrant further study.

56 Triple Negative Breast Cancer: The Ochsner Experience

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Background: Triple negative breast cancer (TNBC) accounts for 15%-20% of breast cancers and is defined by estrogen receptor, progesterone receptor, and human epidermal growth factor receptor 2 (HER2) negative status. TNBC is associated with a significantly higher probability of relapse and poorer overall survival in the first few years after diagnosis compared with other breast cancer subtypes despite its usually high sensitivity to chemotherapy. The unique nature of TNBC makes it an important subtype to study.

Methods: Charts from patients with TNBC treated at Ochsner from 2005-2010 were reviewed for demographic and treatment data. Tumor tissue was evaluated for immunologic biomarkers and genomic biologic evaluation to elucidate specific tumor characteristics. Correlates between demographic, tumor, and treatment variables were examined.

Results: Of the 170 patients included in the study, 65 patients were black and 98 were white. Average stage at diagnosis was 1.62; age was 60 years. Average body mass index was 30. Seventy-three patients did not undergo chemotherapy, while 92 patients did. Ninety-five patients received no radiation, while 70 patients did. Fifty-one patients had a lumpectomy, and 89 patients had a mastectomy.

Conclusion: The average Ochsner patient with TNBC was an obese 60-year-old female. More than half of the patients with TNBC received chemotherapy, and there was a higher incidence of mastectomies than lumpectomies. Both of these findings indicate a more advanced stage at diagnosis. The data support TNBC occurring at an earlier age than other types of receptor-positive breast cancers and suggest that obesity may play a role in the triple-negative characteristic. The characteristics of the patients and their stage of cancer will be correlated to the analyzed tissue features from tissue sampling to obtain a more complete profile of TNBC.

57 Evaluation of Performance Status as a Prognostic Factor in Metastatic Renal Cell Carcinoma in the Era of Pazopanib

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Background: In metastatic renal cell carcinoma, prognostic scoring systems have been developed that define risk groups based on independent prognostic factors for survival. Historically, a poor performance status has been considered a poor prognostic factor. However, these systems were developed in the setting of clinical trials that did not use pazopanib, a multi-tyrosine kinase inhibitor.

Methods: In this retrospective study of patients with metastatic renal cell carcinoma who received pazopanib, we compared progression-free survival (PFS) and overall survival (OS) in patients based on performance status.

Results: Of the 103 patients we identified, 82 patients had a Karnofsky performance status scale score $\geq 80\%$ (good performance status) and 21 patients had a Karnofsky performance status scale score $\leq 80\%$ (poor performance status). In the patients with good performance status, PFS was 11.5 ± 6.5 months. In the patients with poor performance status, PFS was 6.1 ± 4.7 months. In the patients with good performance status, OS was 14.4 ± 9.5 months. In the patients with poor performance status, OS was 14.8 ± 9.2 months.

Conclusion: Our analysis showed that patients with metastatic renal cell carcinoma and poor performance status had worse PFS but similar OS compared to patients with metastatic renal cell carcinoma and good performance status. As new treatments with more manageable toxicities continue to be approved for metastatic renal cell carcinoma, it is possible that performance status may not be as significant a prognostic factor.

58 Very Late Relapse Metastatic Renal Cell Carcinoma: Characteristics and Outcomes of Patients With a Disease-Free Interval >10 Years

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Background: Late relapse of renal cell carcinoma (RCC), presentation with metastatic disease after a disease-free interval of >5 years, is a known behavior of RCC. Recent studies have concluded that late-relapse RCC is associated with favorable patient and tumor characteristics as well as an improved response to targeted therapy (TT) when compared to early relapse patients. Less studied are patients considered very late relapsers, those with a disease-free interval >10 years, so we evaluated the clinical characteristics, response to TT, and outcomes of this unique population.

Methods: We collected data on consecutive patients with RCC who had disease recurrence >10 years after nephrectomy and received TT. Adverse events were graded using the Common Terminology Criteria for Adverse Events v.4.0 and treatment response was graded using Response Evaluation Criteria in Solid Tumors v.1.1.

Results: Among 720 patients with metastatic RCC, 8 relapsed after a >10 year (median 16.7 years, range 11.7-29.0) disease-free interval. All patients presented with clear cell histology; 88% presented in favorable International Metastatic Renal Cell Carcinoma Database Consortium and Memorial Sloan Kettering Cancer Center risk subgroups. All patients presented with multiple metastases, with the most common sites being lung and bone, while unusual sites such as soft tissue, pancreas, and adrenal were also detected. Median time on first-line TT was 20.1 months; 4 patients, 3 patients, and 1 patient received pazopanib (best response: partial response), sunitinib (best response: stable disease), and cytokine (best response: progressive disease) as first-line therapy, respectively. The median number of sequential TTs received was 2 (range 1-4). Four patients died. The median overall survival was 46.6 months (range, 9.8-129 months), and the 3-year overall survival rate was 63%.

Conclusion: Patients undergoing resection of localized RCC have a lifelong risk of disease recurrence. The high metastatic burden and wide distribution of metastases suggest that diagnostic procedures capable of detecting recurrence in all organs may be taken into consideration during surveillance. Our cohort demonstrated favorable prognostic features and treatment responses compared to historic controls.

59 Metastatic Renal Cell Carcinoma Beyond the Third Line: A Single Institution Experience

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60 Predictors and Survival Impact of False-Negative Sentinel Nodes in Melanoma

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61 Choosing Wisely: A Focus on Patient Safety Through Blood Product Stewardship

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Background: More than 45,000 units of blood components are transfused at Ochsner facilities every year and can account for up to 10% of the cost of hospitalization. Transfusion exposures are associated with increased morbidity/mortality, prolonged length of stay, and increased costs of care. The aims of our institutional project were to decrease the units of red blood cells utilized over a 6-month period while simultaneously decreasing both adverse patient reactions and financial expenditure.

Methods: A 3-pronged approach was utilized to focus on system-, education- and electronic medical record (EMR)-based interventions. Best practices were established by a multidisciplinary task force. Laboratory initiatives were designed to decrease iatrogenic anemia via decreasing daily labs and duplicate lab draws while transitioning to small-volume phlebotomy tubes. Educational directives in the form of modules, lectures, and pocket guidebooks were provided. EMR changes included the creation of an anemia laboratory panel and transfusion order set to enhance point-of-care decision making.

Results: Data were collected via a 1-year retrospective chart review. Nonadherence to institutional best practices improved from preintervention 2.4 units/month to postintervention 1.5 units/month ($P=0.0218$). Results showed a 6-month decrease in red blood cell transfusions from 255 units/month to 239 units/month. Average savings were \$8,134/month with an overall 6-months' savings of \$48,800. We were unable to directly correlate adherence to guidelines with decreased patient adverse reactions. Other project successes included increased recruitment of trainees in performance improvement and a 90% satisfaction rate of hospital medicine staff with changes.

Conclusion: Multidisciplinary teamwork, educational initiatives, and EMR maximization can result in a decrease in the total number of blood products administered and a resultant improvement in financial expenditure. Systemwide standardization of guidelines, EMR improvements, and educational initiatives has been implemented to sustain future project momentum.

62 Residents as Educators: Value-Added Integration of Teaching and Leadership Skills

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Background: Residents are expected to teach medical students, interns, and fellow residents. However, not every resident feels prepared for the teaching duties she/he is asked to perform. The Ochsner hospital medicine department consistently scored low on the student end-of-clerkship assessment. With the medical school class size increasing yearly and one-third of medical student knowledge being attributed to house staff teaching, it was important to increase educational interactions and improve student integration within hospital medicine teams.

Methods: The project began in 2014 with the development of a student checklist with goals to achieve during the clerkship. A presurvey was sent to all internal medicine residents to assess their comfort level with teaching. Students also received a presurvey to evaluate their learning experience. The project was launched in 4 cycles. Cycle 1 involved the introduction of the checklist to one teaching team. Cycle 2 involved the incorporation of the project into all hospital medicine teams and the introduction of staff-led teaching skills sessions. In cycles 3/4, workshops on how to provide feedback to medical students were initiated. Both resident and student postsurveys were administered after each cycle.

Results: Resident comfort level with teaching medical students increased from cycle 1 to cycle 2, with 41% stating high comfort level and 58% average comfort level at baseline that increased to 77% high comfort level and 22% average comfort level postintervention. The student involvement as part of the clinical team score improved from an average of 3.63 (cycle 1) to 4.53 (cycle 3). The student overall clinical education experience score at Ochsner increased from an average of 3.50 (cycle 1) to 4.42 (cycle 3).

Conclusion: During the past 12 months, residents have learned to incorporate teaching medical students and peers into their daily workflow. This improvement in teaching skills can be directly correlated to improvements in the students' overall clinical experience.

63 Clinical Outcomes and Appropriateness of Outpatient Parenteral Antimicrobial Therapy

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Background: Outpatient parenteral antibiotic therapy (OPAT) is a practice that has become increasingly important to modern healthcare. OPAT programs are designed to allow prolonged intravenous antibiotic therapy in patients who otherwise do not require hospitalization. The benefits of OPAT include cost effectiveness and decreased hospital-associated complications. However, it is less clear whether OPAT has similar clinical outcomes as inpatient treatment of infections. The objective of this study was to determine unplanned 30-day readmission and short-term mortality rates of patients discharged on OPAT.

Methods: A search of the electronic medical record yielded 286 patients discharged on OPAT between July 1, 2014, and June 30, 2015, of which 255 have been reviewed thus far. Variables included patient demographics, comorbidities, hospitalization details, infectious disease consultation (IDC), outpatient environment, specific therapy utilized, and 30-day readmission rates. Clinical outcomes were determined based on 30-day readmission and short-term mortality rates.

Results: The most common OPAT diagnoses were bacteremia and osteomyelitis. Seventy-five percent of OPAT patients had an IDC prior to discharge, and 5% were intravenous drug users. Blood cultures accounted for 40% of positive infections. Of the positive bacterial cultures, 58% were gram positive and 42% were gram negative. The most commonly isolated organisms were *Escherichia coli*, *Staphylococcus aureus*, and *Pseudomonas* spp. Cephalosporins were the most common OPAT antibiotics used (55%), followed by vancomycin (20%). Readmission and mortality rates are still being analyzed.

Conclusion: OPAT is increasingly being used to administer intravenous antibiotics to patients who have certain types of infections but no other criteria for hospitalization. The economic benefits of this practice are well documented, yet the success of outpatient therapy compared to inpatient treatment is less studied. Our goal is to determine the effectiveness of OPAT in preventing hospital readmissions and short-term mortality. The results of the data are still being processed.

64 Review of Intravenous and Oral Antibiotic Utilization in the Hospital Management of Infections: Focus on Skin and Soft Tissue Infections

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Background: Skin and soft tissue infections (SSTIs) are a commonly encountered medical problem in the hospital setting. Although guidelines have been published to optimize therapy, many patients receive broad-spectrum antimicrobials. The purpose of this study was to describe antibiotic utilization patterns at Ochsner Medical Center.

Methods: A search was performed using the Epic database for hospital encounters with primary and secondary ICD-9 diagnostic codes for SSTI, including 567.31, 675.##, 681.##, 682.##, 683.##, 707.##, 998.59, and 998.83, from January 1 to December 31, 2013. Additionally, patients had to have received antimicrobial therapy, be age 18 years or older, and have clinical criteria for SSTI. Patients without clinical criteria for SSTI and those who were colonized with bacteria, transferred to another acute care facility, or pregnant were excluded.

Results: A retrospective record review was performed of 475 hospital encounters with a total of 329 unique patients. Of those, 164 (35%) met inclusion criteria, with 43% being unique patients. Of those, 67 (41%) had antibiotic therapy during the 10 days prior to admission. Also, 113 (69%) were started on broad-spectrum antibiotics with piperacillin-tazobactam (PIP-TAZO) and vancomycin (VANC). A total of 81 (49%) encounters had culture data. Of the 81 positive cultures, 56 (69%) had PIP-TAZO plus VANC. Additionally, infectious disease consultation (IDC) was performed for 91 (55%) encounters. Lack of consultation translated into inappropriate discharge antibiotic therapy in 66% of the encounters; however, overall appropriate antimicrobial therapy on discharge was 75%.

Conclusion: Despite easily accessible published guidelines on the management of SSTIs, our data show that a vast majority of our patients, 69%, received too broad therapy with PIP-TAZO plus VANC. IDC was associated with more appropriate antibiotic selection. This information will allow us to institute protocols and processes to improve patient care and minimize exposure to antimicrobials when clinically not indicated.

65 Vaccination Compliance in Listed Kidney Transplant Candidates: A Retrospective Chart Review

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Background: Infections in solid organ transplant recipients may result in excess morbidity and mortality. Immunosuppressive agents increase the risk of serious infections and also impair the immunological response to vaccines. Vaccination is most effective if it is given prior to transplantation and prior to initiation of chronic immunosuppression. Immunization should be administered as early as possible during the transplant evaluation period to optimize the immune response. In this study, we examined the immunization status of listed kidney transplant candidates in our renal transplant program to identify the gaps between the current recommendations and the immunization status of this high-risk population. We focused on the patients who are currently not receiving hemodialysis as there is vast amount of information in those patients.

Methods: We performed a retrospective chart review of patients who were listed as kidney transplant candidates and who are not currently on hemodialysis at Ochsner Health System to evaluate the compliance rate of vaccinations for pneumococcus, influenza, and hepatitis B virus. Hepatitis B surface antibodies (HbsAb) were also recorded to determine if patients had immunity against hepatitis B.

Results: One hundred forty patients met the criteria. The immunization rates for the 3 vaccines were low. Only 36.88% of patients received the pneumococcal vaccine, 47.52% received the influenza vaccine, and 25.90% received 3 doses of the hepatitis B vaccine. HbsAb titer was found only in 9.93% of listed patients.

Conclusion: The overall immunization compliance rate was found to be low for pneumococcus, influenza, and hepatitis B vaccines, suggesting a significant gap between the immunization status and the current recommendations for such a high-risk population. An integrated routine workflow needs to be in place during our pretransplant evaluation process so we can effectively engage our specialists and staff in vaccine adherence improvement.

66 Autosomal Dominant Polycystic Kidney Disease and Vitamin D Deficiency at the Ochsner Health System

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Background: Autosomal dominant polycystic kidney disease (ADPKD) occurs in 1:400 to 1:1000 live births and is the most common cause of genetic chronic kidney disease. Because of this frequency, primary care physicians may encounter this disease in their practices and are optimally positioned to manage patients with ADPKD and the associated comorbidities of hypertension, nephrolithiasis, and secondary hyperparathyroidism.

Methods: This study was a retrospective chart review utilizing Epic to examine the prevalence of ADPKD at the Ochsner Health System. Additionally, we investigated vitamin D deficiency in this population and evaluated the utility of supplementation.

Results: From an initial population of 525 patients with a diagnosis of polycystic kidney disease included in the chart problem list, 151 patients were selected for our study based on age (15-50 years) and appointment with an Ochsner physician between July 2012 and July 2015. This population was further divided between patients taking vitamin D supplements (20/151) and those not taking supplements (131/151). In the nonsupplement group, we discovered that 16/131 patients were vitamin D deficient and an additional 37/131 patients did not have a recorded 25(OH)D value.

Conclusion: Vitamin D deficiency is correlated with multiple health complications, including secondary hyperparathyroidism and cardiovascular disease; supplementation is currently the accepted standard of care. Our study demonstrates a possible area for safe, accessible, and inexpensive quality improvement at the primary care level in the diagnosis and treatment of vitamin D deficiency in patients with ADPKD. This study was inspired by a patient with ADPKD seen at the Ochsner Center for Primary Care and Wellness with elevated parathyroid hormone (PTH) after discontinuing vitamin D supplements. At the patient's follow-up appointment 6 months after restarting the supplement, her vitamin D levels had increased, PTH values had decreased, and, most important, the patient reported symptomatic improvement.

67 Huddle Up: An Interdisciplinary Approach to Reduce Chaos in the Resident Clinic

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Background: Our medium-sized internal medicine residency program transitioned from the traditional schedule of a weekly, half-day clinic to 4+2 block scheduling. The number of residents increased (from 6 to 10), as did patient throughput. These increases, combined with previously unrecognized inefficiencies, such as lack of clarity in room assignments, unequal distribution of medical assistants, and preceptor availability, resulted in a chaotic clinic with significant patient care and precepting delays.

Methods: The clinic commissioned a lean team investigation, and the results were analyzed in 2 small-group workshops that included all stakeholders in the resident clinic. Solutions included assigning each resident to a single clinic room and assigning 1 medical assistant and 1 faculty preceptor to a group of 3-4 residents. A huddle board was used to implement these changes. The huddle board is a whiteboard with horizontal assignment lanes and photographs of faculty preceptors, residents, and medical assistants in separate lanes. Via the huddle board, assignments of residents to clinic rooms, medical assistants, and faculty became obvious to everyone. The appointment durations were measured for 6 weeks before and after the intervention.

Results: There were reductions in appointment duration (201 to 113 min), median length (54 to 46 min), and appointments >60 min (39% to 27%). The overall average duration decreased from 59 to 50 minutes ($P=0.0001$, two-tailed t test]. The huddle board intervention was well received. Faculty preceptors, residents, and staff agreed that the huddle board reduced confusion in the resident clinic (90%), the huddle board was a valuable tool (88%), the named photos allowed for better recall of colleagues (93%), and having 1 room assigned per resident was more efficient (85%).

Conclusion: The huddle board is a simple, easily accessible, inexpensive intervention associated with reduced appointment times and improved satisfaction and can be easily replicated by other resident clinics to streamline operations.

68 An Intervention to Improve the Patient Experience in Primary Care

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Background: Measurements of patient experience are frequently used to evaluate the quality of healthcare systems and providers, as patient experience has been shown to be positively correlated with clinical effectiveness, safety, and outcomes. On this basis, many pay-for-performance programs use patient experience surveys as performance indicators. Thus, monitoring patient experience data and implementing improvement measures based on these data can improve not only the patient experience but also healthcare quality and patient safety. We conducted a year-long initiative at a single institution with the objective of improving patient experience as measured by the Clinician and Group Consumer Assessment of Healthcare Providers and Systems (CG-CAHPS) survey.

Methods: The CG-CAHPS survey was used to assess patient experience in 5 domains: access to care, provider communication, office staff courtesy, test results/care coordination, and overall provider rating/provider recommendation. Participants included a random selection of 2,515 visitors to a primary care clinic. Various initiatives were implemented on a quarterly basis and focused on increasing providers' familiarity with the survey and improving communication with patients using AIDET strategies. AIDET (an acronym for Acknowledge, Introduce, Duration, Explanation, Thank you) provides a framework for effective communication aimed at minimizing patient anxiety and bolstering clinical relationships.

Results: Comparing results from first quarter to fourth quarter 2015, no change was observed in provider communication quality (92.7% vs 93.4% yes; $P=NS$), office staff quality (93.7% vs 95.2% yes; $P=NS$), care coordination, or overall provider rating (89.3 vs 91.6 yes; $P=NS$), although all results showed percentile improvement vs comparators. The access to care 3-month rolling average improved significantly (77.9% yes vs 90.4% yes; $P=0.0011$). All comparisons were analyzed via chi-square.

Conclusion: Using easily adaptable interventions focused on better communication, patient experience can be measured and enhanced. High baseline patient experience ratings may have limited our ability to measure improvement.

69 Admission Neutrophilia and Outcome in Intracerebral Hemorrhage

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Background: Neuroinflammation is an important component of cerebrovascular diseases such as intracerebral hemorrhage (ICH). Neutrophils play an important role in acute inflammation. We aimed to study if admission neutrophil count (ANC) can be used as a predictor of outcome in patients with ICH.

Methods: A total of 244 patients admitted with spontaneous ICH between November 2013 and September 2015 were retrospectively identified. Key variables included white cell count (WBC), neutrophil counts on admission and 2 consecutive days thereafter, ICH volume (ICV), and presence of intraventricular hemorrhage (IVH). Based on laboratory values, neutrophilia was defined as ANC >7.7 K/uL. Discharge disposition, whether favorable or unfavorable, was the primary outcome. We defined favorable outcome as discharge to home or inpatient rehabilitation, whereas unfavorable outcomes included death, hospice, long-term acute care, and skilled nursing facilities placement. Bivariate analysis for association was done using chi-square test for comparing proportions between groups, and continuous variables were analyzed using t test or Wilcoxon test as appropriate. Logistic regression was performed to evaluate predictors of outcome.

Results: Fifty percent of patients had favorable outcomes. Older age, high ANC (8.4 ± 5 K/uL, $P=0.012$), clopidogrel therapy, IVH, ICV >60 cc, ICH expansion, hyperglycemia, Graeb score, positive blood cultures within the first 72 hours, and any infections during hospital stay were significantly associated with poor outcome. Significant association between ANC >7.7 K/uL and ICH volume (42 cc, $P=0.01$) and IVH were found. On multiple logistic regression analysis, age, history of diabetes, hyperlipidemia, ICH expansion, and ANC (odds ratio [OR]=1.69, 95% CI 1.05-2.72, $P=0.03$) were independent predictors of unfavorable outcome, in contrast to admission WBC that was found to be a predictor of favorable outcome (OR=1.61, $P=0.03$).

Conclusion: Compared to total WBC, absolute neutrophil counts were a strong predictor of poor outcomes in patients with ICH.

70 Mothers' Experiences With Using Galactagogues for Lactation: An Exploratory Cross-Sectional Study

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Background: Worldwide, 30%-80% of women report insufficient milk supply as the reason for breastfeeding cessation. In the United States, 15% of women report the use of herbal galactagogues to improve milk production, yet there is little evidence of safety and efficacy. Likewise, there is limited research on the use of pharmaceutical galactagogues that may cause side effects and are typically prescribed off-label for lactation. Therefore, the aim of this research was to understand mothers' experiences using herbal and pharmaceutical galactagogues.

Methods: A survey consisting of 17 items assessing galactagogue usage and 11 demographic questions was distributed to a convenience sample of mothers in the United States using social media and community breastfeeding support programs. Mothers were informed that their participation was voluntary, no identifiable information was collected, and survey results would not directly benefit the participants but potentially could provide knowledge to guide future research and practice.

Results: A total of 188 women from 28 states completed the survey. The majority were white (77%), were non-Hispanic (79%), were employed (58%), had a college/graduate degree (60%), and were married (73%). Most (80%) had breastfed one infant, 46% supplemented with formula, and 60% consulted a provider regarding insufficient milk supply. Fenugreek (86%) was the most widely known herbal galactagogue; the internet was the primary source of information for 56%, and 53% had used the supplement. Side effects were reported by 44%, but 44% also considered fenugreek safe, would use it again (69%), and would recommend it to another mother (70%). Only 36% had heard of domperidone; more mothers had used metoclopramide (17%) vs domperidone (1%). Metoclopramide was considered somewhat safe (33%), but 100% experienced side effects.

Conclusion: Although this sample is not representative of US mothers, the description of the mothers' experiences warrant further research on the safety and efficacy of galactagogue usage for insufficient milk supply.

71 Gap in Patient Expectations of Deep Brain Stimulation for the Treatment of Parkinson Disease

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72 Reducing Catheter-Associated Urinary Tract Infection and Indwelling Urinary Catheter Utilization Through Implementation of a Nurse-Driven Foley Removal Protocol

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Background: The prevention of catheter-associated urinary tract infection (CAUTI) is a national quality initiative to promote patient safety. Healthcare facilities are challenged to implement evidence-based practices to eliminate CAUTI by reducing Foley urinary catheter utilization. Nurse-driven urinary catheter removal guidelines are reported to decrease catheter utilization and require full organizational commitment to sustain the cultural change.

Methods: A CAUTI task force consisting of leaders from infection control, nursing, and medicine collaborated to incorporate evidence-based CAUTI prevention strategies. A nurse-driven protocol for Foley removal that includes a decision algorithm was implemented in May 2015 following nurse education and competency/skills checkoffs. The infection prevention team rounded 3 times/week in noncritical care units to assess the following: (1) orders written for Foley placement, (2) appropriate indicators for continuation of Foley using the algorithm, (3) Foley utilization rates (total number of Foley catheter days/total number of patient days $\times 100$). Feedback on nursing compliance with the protocol was sent to nursing leaders weekly for follow-up with staff and to troubleshoot processes to improve compliance.

Results: In 3 months, appropriate Foley placement orders increased from 10%-75%, and appropriate Foley discontinuation increased from 25%-90%. Overall, Foley utilization rates have not decreased significantly, but more data over time are needed to adequately assess for improvement. More important, organizational culture has started to shift; audits reveal increased willingness by physicians and nurses to discontinue indwelling urinary catheters and explore alternatives.

Conclusion: Success of this initiative is dependent on continued sustainment of staff compliance to decrease inappropriate catheter utilization. Future strategies to improve processes include electronic medical record clinical alerts, identification of nursing and physician champions, and a survey to better understand caregiver knowledge and attitudes regarding appropriate Foley catheter utilization and CAUTI prevention.

73 Milk Immune Components Among African American Mothers With and Without Medicaid

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74 Knowledge of Incontinence and Pelvic Organ Prolapse in Community-Dwelling Women Without a Recent Gynecologic Visit Compared to Those With a Recent Gynecologic Visit

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Background: Pelvic floor disorders affect many aspects of a woman's sense of well-being. Nearly one-quarter of women have at least one type of pelvic floor disorder.

Methods: Community-dwelling women in New York City were approached to participate in the study. The Prolapse and Incontinence Knowledge Questionnaire (PIKQ) was used to assess participants' knowledge. Primary endpoints were the total number of correct responses on the urinary incontinence (UI) and pelvic organ prolapse (POP) scales. The percentages of individuals answering each item or group of items correctly were explored as secondary outcomes. For this analysis, women who had not seen a gynecologist in 3 years were compared to women who were having annual gynecologic examinations with chief complaints other than prolapse and incontinence.

Results: A total of 41 patients were surveyed: 19 were clinic patients and 22 were community-dwelling women. Their median age was 52 years (range, 40-83), median parity was 3 (range, 0-8), and 59% of the respondents were perimenopausal or menopausal. Three of 19 clinic patients and 5 of 22 community-dwelling women ($P=0.21$) worked in healthcare. Seventy-four percent and 49% of clinic patients and community women, respectively, had incomes of \$1-49K. Proficiency in the PIKQ-UI scale was 64% and 58% for the clinic and community groups, respectively. Proficiency in the PIKQ-POP scale was 37% and 23% for the clinic and community groups, respectively. Analysis of individual questions found PIKQ-POP question #1 (prolapse is more common in younger women than older women) to have an 82% correct response rate among clinic patients compared to a 42% correct response rate among community-dwelling women ($P=0.0143$).

Conclusion: There is a global lack of knowledge about UI and POP. In our study group, there was a higher proficiency of knowledge of incontinence compared to prolapse. Among community-dwelling women who have not seen a gynecologist, the knowledge base seems slightly decreased.

75 No Woman Should Die While Giving Life: A Review of the Preventability of Maternal Mortality in the Ochsner Health System, New Orleans

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Background: The UN Millennium Development Goal 5 envisioned a 75% reduction in maternal mortality ratio (MMR) between 1990 and 2015. The United States moved in the opposite direction, increasing maternal deaths from 12/100,000 in 1990 to 28/100,000 in 2013. This study sought to determine the preventability of in-hospital maternal mortality in the Ochsner Health System.

Methods: We conducted a retrospective cohort study of all known cases of in-hospital death of patients while pregnant, during delivery, or in the 6 weeks after termination of pregnancy across the Ochsner Health System for the period 1995-2013. Charts fitting these inclusion criteria were analyzed for preventability by a 10-expert multidisciplinary team.

Results: Sixteen deaths were recorded in the study period, 12 of which were potentially preventable. A potentially preventable death was more likely to occur if the patient was transferred to or within Ochsner (relative risk=5.5, 95% CI: 1.2-24.9; $P=0.01$). Deaths were also more likely to be potentially preventable if the patient was uninsured or insured with Medicaid compared to those with private insurance ($P=0.003$).

Conclusion: Predisposing and precipitating factors can help obstetricians predict if a woman will suffer a preventable obstetric event that hastens her mortality. The predisposing factor most predictive of mortality is insurance status. We correlated a larger proportion of total deaths and preventable obstetric events in years when the Louisiana Medicaid Program for Pregnant Women received the least funding. The precipitating factor most predictive of mortality was transfer into or within the Ochsner Health System. The majority of transferred patients (3/5=60%) suffered provider- and systems-based failures of care, without being complicated by patient factors.

76 Minimally Invasive Lateral Lumbar Interbody Fusion vs Transforaminal Lumbar Interbody Fusion: Patient-Centered Results

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Background: The documented benefits of minimally invasive surgery (MIS) continue to be elucidated. These include decreased soft tissue disruption, decreased blood loss, and shorter length of stay (LOS). The various MIS techniques each have inherent benefits. The direct patient benefit of one procedure over the other (lateral lumbar interbody fusion [LLIF] vs transforaminal lumbar interbody fusion [TLIF]) has yet to be clinically established. We analyzed the operative time and blood loss, postoperative visual analog scale (VAS) pain scores, and LOS associated with each procedure.

Methods: All patients with 1- and 2-level MIS LLIF and TLIF procedures with 2-year follow-up were included in the analysis. Total operative time, blood loss, immediate postoperative and day of discharge VAS pain scores, and LOS were recorded. Patients were divided into 2 groups. Group 1 was patients who received LLIF; Group 2 was patients who received TLIF.

Results: A total of 173 patients met the inclusion criteria: 74 patients in Group 1 and 99 patients in Group 2. There were no differences in body mass index, levels fused, perioperative complications, or immediate postoperative or discharge VAS scores between the 2 groups. Significant benefits were observed in the LLIF group compared to the TLIF group regarding the number of patients discharged on postoperative day (POD) 1, (48% vs 0%, $P<0.001$), overall LOS (2.1 vs 3.5 days, $P<0.001$), mean operative time (154 vs 265 min, $P<0.001$), and total operative blood loss (102 vs 206 cc, $P<0.001$), respectively. Subgroup analysis of 1-level procedures only (LLIF: 59 patients; TLIF: 80 patients) strengthened the statistical analysis.

Conclusion: There were no differences in perioperative complications or immediate postoperative or discharge VAS scores between the 2 groups. The overall LOS was significantly lower in the LLIF group, and the number of patients discharged on POD 1 was significantly higher. Total operative time and blood loss were also significantly lower in the LLIF group. Further prospective analysis is required to better delineate the comprehensive benefits of one procedure over the other.

77 Lumbar Disc Geometry Affects the Risk for Rod Fracture in Adult Spinal Deformity Surgery

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Background: Rod fracture (RF) has significant consequences for patients, including pain, loss of correction, and revision surgery. Risk factors associated with RF include previous spine surgery, insufficient sagittal vertical axis (SVA) correction, and pedicle subtraction osteotomy (PSO). Increased lumbar disc geometry, regardless of PSO, SVA correction, or previous surgery, may be a risk factor affecting RF rates.

Methods: All patients with adult spinal deformity having open posterior fusion constructs crossing the thoracolumbar junction and pelvis with scoliosis x-rays and 2-year follow-up were included in the analysis. Patients were divided into 2 groups: Group 1 included patients with RF, and Group 2 was patients with no RF.

Results: Thirty-nine of 52 patients met the inclusion criteria. Group 1 included 15/39 (38%) patients with RF, all requiring revision surgery. Group 2 included 24 (62%) patients without RF. There was no difference in age, construct length, number of nonfused lumbar discs, previous spinal surgery, or preoperative or postoperative SVA correction or PSOs between the groups. Vertical stature and male sex were significantly higher in the RF group. There were significant differences between the RF vs no-RF groups in L1/2 disc heights (H) (8.5 vs 6.5 mm, $P=0.03$), L2/3 H (9.6 vs 6.7 mm, $P=0.015$), L1/2 diameters (D) (41.4 vs 34 mm, $P<0.01$), L2/3 D (43.2 vs 36.2 mm, $P=0.01$), L1/2 volumes (V) (11,714 vs 7,817 mm³, $P=0.02$), and L2/3 V (14,025 vs 8,955 mm³, $P=0.02$), respectively.

Conclusion: The overall prevalence of RF was 38% with no differences in previous spinal surgery, SVA correction, or PSOs between the 2 groups. Vertical stature and male sex were significantly higher in the RF group. Patients with RF had significantly larger nonfused disc heights, diameters, and volumes adjacent to the PSO or apical lumbar vertebra. Increased disc geometrics may allow for increased micromotion and increased rod stresses and rates of RF.

78 Bicortical S1 Screw Fixation May Obviate the Need for Iliac Screws in Minimally Invasive Surgery for Adult Spinal Deformity

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Background: Iliac screw fixation is advocated in traditional open long-fusion constructs in the treatment of adult spinal deformity (ASD). Minimally invasive surgery (MIS) allows for the maintenance of the spine's soft tissue envelope, preserving many of its stabilizing structures. Additional lumbosacral stability can be obtained when S1 screws are placed in a bicortical fashion. MIS techniques, along with bicortical S1 screw placement, may obviate the need for iliac screw fixation in the treatment of ASD.

Methods: A retrospective review of all patients with ASD treated using less invasive techniques was conducted. In both groups, lateral lumbar interbody fusion was performed for all lumbar levels L1-L5, transforaminal lumbar interbody fusion at L5-S1, and bicortical S1 screws. Patients were divided into 2 groups: Group 1 (hybrid) was open pedicle screws with bilateral iliac screw fixation; Group 2 (MIS) was percutaneous pedicle screws without iliac screws. Computed tomography (CT) scans were obtained 1 year postoperatively.

Results: Twenty-seven patients met inclusion criteria with an average follow-up of 2 years. Group 1 included 11 patients, and Group 2 included 16 patients. There was a statistical increase in Group 1 vs 2 in mean posterior construct length (10 vs 6 levels, $P<0.05$), blood loss (1,727 vs 465 mL, $P<0.001$), operative time (505 vs 329 min, $P<0.001$), complications (8 [72%] vs 5 [31%] patients, $P=0.03$), and length of stay (14 vs 7.6 days, $P<0.01$). CT scans read by 2 independent radiologists confirmed solid fusion at all interbody levels including L5-S1. There were no hardware complications.

Conclusion: MIS techniques preserve many of the spine's stabilizing structures. Additional lumbosacral stability is observed when S1 screws are placed bicortically. A 100% fusion rate was obtained without hardware complication in our patient cohort. MIS techniques and bicortical S1 pedicle screws may obviate the need for iliac screw fixation in long-instrumented ASD constructs.

79 Incidence of Lumbar Plexopathy Utilizing Mechanomyography for Transpsoas Lateral Lumbar Interbody Fusion

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Background: Reported incidences of thigh complications during transpsoas lateral lumbar interbody fusion (LLIF) range from 0.7%-75%. The reliability of electromyography (EMG) has been questioned because of false-positives and false-negatives. Common operating room equipment can also cause electrical interference with EMG. Mechanomyography (MMG) may provide a safe alternative to EMG. We evaluated the incidence of thigh complications of transpsoas LLIF using MMG.

Methods: A retrospective review of prospectively collected data was completed at 4 institutions. Eighty-five consecutive patients (175 levels fused) who underwent transpsoas LLIF surgery (L1-L5) during a 1-year period were included in the analysis. Immediate postoperative and routine follow-up clinical examinations were obtained.

Results: The rate of all ipsilateral thigh symptoms (pain, numbness, and weakness) was 21.2% (18/85). Eight patients (9.4%) had iliopsoas or quadriceps weakness (3/5 motor strength). Ten patients (11.8%) had anterior thigh pain and/or numbness. Most patients with postoperative thigh symptoms (16/18) had 3- or 4-level procedures performed for degenerative scoliosis and included L4/5. All thigh symptoms resolved within 3 months.

Conclusion: MMG is the mechanical signal seen from the surface of a muscle when it contracts after stimulation. MMG is an effective alternative to EMG for nerve mapping during transpsoas LLIF surgery and overcomes deficiencies related to electrical interference and high rates of false-positives and false-negatives inherent to EMG. With MMG, the rate of ipsilateral thigh symptoms was 21.2%, which is consistent with currently reported rates for transpsoas procedures utilizing EMG. Most thigh symptoms occurred in multilevel procedures; direct trauma to the psoas may have contributed to our results. All symptomatic patients had L4/5 included in their construct. MMG is a safe alternative to EMG to monitor the lumbar plexus when performing transpsoas LLIF.

80 A Novel Technique for Performing Pedicle Subtraction Osteotomies May Decrease Operative Time, Blood Loss, Perioperative Complications, and Length of Stay

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Background: Pedicle subtraction osteotomies (PSOs) are technically demanding given the proximity of neural structures and associated increased blood loss secondary to epidural and cancellous bleeding. Straight osteotomes are commonly used to perform PSOs and can result in variable amounts of correction, leading to longer operative times and increased blood loss. We report a novel technique utilizing fixed-angle (25-, 30-, and 35-degree) triangular shavers to perform the PSO.

Methods: All patients who underwent a single-level PSO with 2-year follow-up were analyzed. Patients were divided into 2 groups depending on the PSO technique. Group 1 consisted of patients with traditional straight osteotomes, and Group 2 consisted of patients with fixed-angled triangular shavers. All aspects of each surgical case were evaluated.

Results: Group 1 included 8 patients, and Group 2 included 10 patients. There were no differences in mean age, height, weight, total operative time, total estimated blood loss, or number of levels fused between the 2 groups. There were 6 revision surgeries in Group 1 and 8 in Group 2. Group 1 included 2 patients with fusion takedowns (2/6 revisions, 33%); Group 2 included 8 patients (8/8 revisions, 100%), ($P=0.018$). In Group 1, 4 patients (50%) underwent Smith-Petersen osteotomies (SPOs); in Group 2, 10 patients (100%), ($P=0.008$). There was no difference in the number of SPOs performed (mean=4.5). There was a difference between Group 1 vs 2 in mean PSO time (52 vs 33 minutes, $P=0.032$), PSO estimated blood loss (1,018 vs 463 mL, $P=0.047$), intensive care unit length of stay (6 vs 3 days, $P=0.030$), hospital length of stay (9.3 vs 6.1, $P=0.041$), and major complications (8 vs 3, $P=0.029$), respectively.

Conclusion: We report our experience of a novel and reproducible PSO technique utilizing fixed-angle triangular shavers. Although the total operative time and estimated blood loss were similar, Group 2 had more patients with revision surgery, SPOs, and fusion mass takedown, all of which are associated with increased blood loss.

81 Autograft vs Allograft Comparison in Pediatric Medial Patella-Femoral Ligament Reconstruction

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Background: Medial patella-femoral ligament (MPFL) reconstruction is commonly used to treat patellar instability. Despite many different reported graft types and techniques, there is a paucity in the literature regarding survivorship and cost related to the graft options. The purpose of this study was to evaluate the differences in survivorship, clinical outcomes, and cost between autograft and allograft usage in MPFL in pediatric patients.

Methods: This was a retrospective review of 56 patients who underwent MPFL reconstruction between 2012 and 2015 by a single surgeon for both acute and chronic patellar instability. Autograft gracilis tendon was used for Group 1 (21 patients). Allograft gracilis tendon was used for Group 2 (35 patients). Kujala scores were gathered on all patients postoperatively. Survivorship, surgical time, cost, graft size, and tibial tubercle-trochlear groove (TT-TG) difference were compared.

Results: The average age of all patients was 16 years. There were no differences in age, chronicity, or TT-TG distance between the groups. Group 1 (autograft) had significantly longer operative times (135 min vs 97 min, $P<0.001$), higher rates of graft failure (28% vs 0%, $P=0.002$), and worse Kujala scores (80 vs 92, $P=0.003$) postoperatively than Group 2. All failures were in chronic dislocators and occurred at 14 months on average. With regard to cost, autograft required more time for harvest and closure (40 min = \$445 for this procedure), but allograft tendon cost \$1,058. Overall, autograft was significantly more costly because of the cost of reoperation. Graft size was larger in the allograft group ($P=0.0009$)

Conclusion: In our review of graft choices for MPFL reconstruction in pediatric patients, allograft is recommended for chronic patellar instability because of improved survivorship and clinical outcome scores, lower overall cost, and lower reoperation rate.

82 Robotically Assisted Partial Knee Arthroplasty vs Total Knee Arthroplasty: Retrospective Study With 1-Year Follow-Up

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83 Factors Affecting the Union of Opening Wedge High Tibial Osteotomy Using a Locking Titanium Wedge Plate

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Background: Factors that can affect the success rate of high tibial osteotomy include patient selection, surgical technique, type of fixation hardware, supplemental fixation, choice of bone graft, and rehabilitation protocol. Our hypothesis is that the most important variable affecting the healing rates of opening wedge osteotomy is whether an intact bony and periosteal hinge is maintained.

Methods: A total of 60 patients (mean age, 40 years) who underwent 64 primary high tibial osteotomies were identified from our database and observed at a mean of 2 years. Surgical correction was followed by immediate range of motion and a progressive weight-bearing protocol. Clinical and radiographic data were reviewed for patient demographics, bony union, iatrogenic fractures, loss of correction, and other complications.

Results: The average time to radiographic union was 14.8 weeks (range, 8-24 weeks) in patients with complete radiographic data. Loss of correction and/or collapse occurred in 6 patients (9.8%), 3 of whom underwent revision osteotomy at mean of 8 months (range, 6-9 months) after the index procedure. Nine unrecognized hinge fractures were retrospectively identified, 4 of which resulted in intraarticular extension and 4 of which resulted in nonunion and collapse. There was a significantly higher incidence of unrecognized hinge fractures in cases that collapsed compared to cases that healed uneventfully ($P=0.003$).

Conclusion: A high index of suspicion must be maintained intraoperatively and postoperatively to identify and treat unstable constructs that increase the risk of nonunion and collapse after opening wedge high tibial osteotomy.

Table.

Variable	Mechanical Complication (collapse/loss of correction)		P	Number Responses
	No	Yes		
Age, mean \pm SD	39.7 \pm 10.9	45.2 \pm 5.1	0.23	64
BMI, mean \pm SD	27.3 \pm 5.2	28.9 \pm 3.7	0.47	54
Plate size, mean \pm SD	8.2 \pm 2.9	10.4 \pm 4.0	0.09	64
Weight, mean \pm SD	183.0 \pm 47.4	183.3 \pm 18.2	0.97	56
	n (%)			
Gender			1.0	64
Male	39 (67.2)	4 (66.7)		
Female	19 (32.8)	2 (33.3)		
Allograft			0.14	64
No	46 (79.3)	3 (50.0)		
Yes	12 (20.7)	3 (50.0)		
Completed fracture			0.003	63
No	52 (91.2)	2 (33.3)		
Yes	5 (8.7)	4 (66.7)		
Tobacco use			0.66	59
No	39 (73.5)	4 (66.7)		
Yes	14 (26.4)	2 (33.3)		
Medial or lateral			1.0	64
Medial	50 (86.2)	5 (83.3)		
Lateral	8 (13.7)	1 (16.7)		
Combined procedure			0.10	64
Yes	32 (55.2)	1 (16.7)		
No	26 (44.8)	5 (83.3)		

Numerical variables were assessed using *t* tests. Categorical variables were assessed using Fisher exact test (because assumptions of the χ^2 test were not met).

84 Sinonasal Tract Inflammation as a Precursor to Nasopharyngeal Carcinoma: A Systematic Review and Metaanalysis

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85 Pediatricians' Confidence and Behaviors in Smoking Cessation Promotion

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Background: Secondhand smoke exposure (SHSe) increases the risk for wheezing, bronchiolitis, pneumonia, and otitis media in infants and children. Thirty-three percent of caregivers who accompany their child to the Ochsner Children's Clinic smoke—a number that is almost double the national average of 18%. None of the eligible caregivers who smoke utilizes the Smoking Cessation Trust (SCT), a free smoking cessation program for Louisiana residents who began smoking before 1988. Considering an average of 60,000 patient encounters a year, Ochsner pediatricians can potentially refer an estimated 8,700 smoking caregivers to the SCT. The objective of this study was 2-fold: first, to examine pediatricians' confidence and behaviors with regard to promoting smoking cessation in caregivers, and second, to determine pediatricians' knowledge and comfort level with the SCT.

Methods: Pediatricians were given a questionnaire to assess their confidence and practice when screening, counseling, and referring caregivers to smoking cessation programs.

Results: Thirty-six questionnaires were administered, of which 23 were completed (64%). Only 9% of pediatricians reported that they had formal training in smoking cessation. While 78% had heard of the SCT, 91% reported that they do not refer to the SCT. When reporting confidence, all the pediatricians stated that they were confident in their ability to screen for SHSe. Sixty-one percent were confident in providing counseling, and 43% were confident in offering referrals. With regard to behavior, the majority of pediatricians screened for SHSe regularly (73%); however, only 30% counseled smoking caregivers to quit, and only 13% provided a smoking cessation referral.

Conclusion: Efforts should be made to increase the rate by which pediatricians provide smoking cessation, counseling, and referrals through education and training. In addition, pediatricians need to be educated on the available smoking cessation programs, especially the SCT, to promote such services to caregivers.

86 Comparison of Pharmacist-Managed vs Physician-Managed Vancomycin Dosing at a Large Academic Medical Center

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Background: Therapeutic drug monitoring (TDM) is helpful in achieving therapeutic concentrations of vancomycin and preventing drug-induced toxicities. Despite wide use of pharmacist-managed vancomycin TDM, there is a scarcity of literature comparing it to physician-managed vancomycin TDM. The objective of this study was to compare pharmacist-managed vs physician-managed vancomycin TDM at Ochsner Medical Center.

Methods: This prospective cohort study included patients >18 years of age who were admitted to Internal Medicine Teams 1, 2, 3, and 5 and who were initiated on a vancomycin dosing regimen between April 23, 2015, and June 26, 2015. During this period, providers on Teams 3 and 5 were able to order a consult for a pharmacist to manage vancomycin. A pharmacy consult allowed pharmacists to adjust vancomycin doses and order levels, per protocol. The primary outcome was the proportion of patients receiving an appropriately dosed initial vancomycin regimen. Secondary outcomes included the proportion of patients receiving an appropriately adjusted vancomycin regimen, time to therapeutic vancomycin level, percentage of vancomycin levels within therapeutic range, percentage of unnecessary levels drawn, and cost.

Results: An appropriate initial dosing regimen was achieved in 69% and 44% of the pharmacist and physician groups, respectively ($P=0.010$). Vancomycin was appropriately adjusted among 100% of the pharmacist-managed patients vs only 50% in the physician group. Of the levels drawn, 51% were within the therapeutic range in the pharmacist group vs 25% in the physician group ($P<0.001$). Therapeutic levels were reached faster in the pharmacist group. The proportion of unnecessary levels was significantly lower in the pharmacist group (13% vs 26%, $P=0.02$), resulting in cost savings for the patients and the hospital.

Conclusion: Implementing a pharmacist-managed vancomycin program resulted in more appropriate dosing of vancomycin.

87 Retrospective Review of Fosaprepitant for Prophylaxis and Treatment of Nausea and Vomiting in Patients Undergoing Autologous Stem Cell Transplant

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Background: The National Comprehensive Cancer Network guidelines and the American Society of Clinical Oncology recommend a combination of serotonin (5-HT₃) receptor antagonists and dexamethasone to prevent chemotherapy-induced nausea and vomiting (CINV) in patients undergoing autologous hematopoietic stem cell transplant (HSCT). However, because of high-dose multiday chemotherapy regimens, acute and delayed CINV can overlap. Neurokinin 1 receptor antagonists such as fosaprepitant can have an impact on preventing delayed CINV when used in combination with serotonin (5-HT₃) receptor antagonists and dexamethasone; however, data supporting the use of fosaprepitant in autologous HSCT patients are limited. The aim of this study was to determine if fosaprepitant administration decreases the number of breakthrough antiemetic doses, length of stay, and administration of parenteral nutrition during autologous HSCT.

Methods: The study was approved by the institutional review board. In this retrospective chart review, autologous HSCT patients who received fosaprepitant were compared with those who did not receive fosaprepitant to evaluate the efficacy of fosaprepitant use in patients undergoing HSCT. A subgroup analysis of the fosaprepitant group compared the number of breakthrough antiemetic doses given between patients who received prophylactic fosaprepitant doses and those who received rescue doses of fosaprepitant.

Results: The study found no statistical difference in primary and secondary outcomes between patients who received fosaprepitant compared to patients who did not receive fosaprepitant. The subgroup analysis of patients who received fosaprepitant prophylaxis doses compared to fosaprepitant rescue doses also did not show significant difference in terms of primary and secondary outcomes.

Conclusion: Administration of fosaprepitant for CINV in patients undergoing HSCT was not associated with decreased antiemetic rescue doses, hospital length of stay, or total parenteral nutrition days in this retrospective cohort study.

88 Empiric Antibiotic Treatment for Ventilator-Associated Pneumonia

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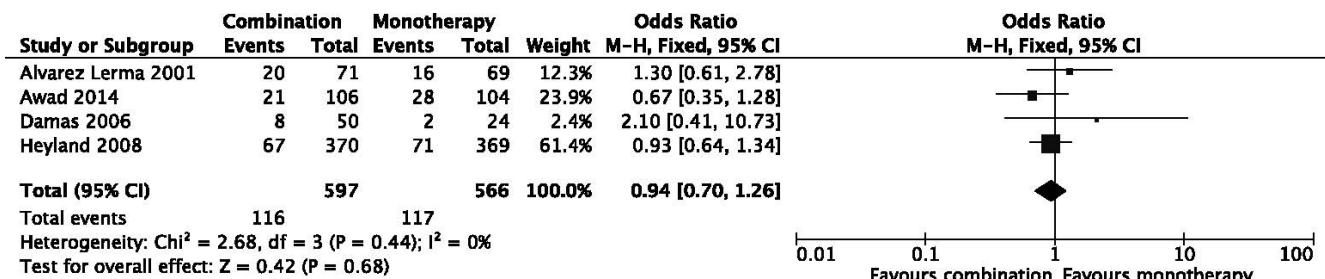
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Background: Ventilator-associated pneumonia (VAP) is a significant cause of morbidity and mortality, complicating the medical course of 8%-28% of mechanically ventilated patients. The selection of initial antibiotic therapy in VAP is important, as inappropriate initial antimicrobial treatment is associated with higher mortality and longer hospital stay in intensive care unit patients.

Methods: For this metaanalysis, we searched CENTRAL, MEDLINE, EMBASE, LILACS, CINAHL, and Web of Science. We included randomized controlled trials comparing empirical antibiotic treatments of VAP in adult patients, with VAP defined as new-onset pneumonia that developed more than 48 hours after endotracheal intubation.

Results: We included 12 studies with a total of 3,571 participants. For monotherapy vs combination therapy, we found no statistical difference in all-cause mortality (odds ratio 0.94 [0.70, 1.26] at 95% CI), clinical cure (odds ratio 0.88 [0.56, 1.36] at 95% CI), or adverse effects (odds ratio 1.08 [0.79, 1.49] at 95% CI). For carbapenem vs non-carbapenem therapy, we found no statistical difference in all-cause mortality (odds ratio 0.59 [0.30, 1.19] at 95% CI) or adverse effects (odds ratio 0.78 [0.56, 1.09] at 95% CI), but we found that carbapenems are associated with a statistically significant increase in clinical cure (odds ratio 0.67 [0.49, 0.93] at 95% CI).

Conclusion: This review supports the use of monotherapy for the treatment of VAP. Because the studies did not identify patients with increased risk for bacteria, these data may not be generalizable to all patient groups. Owing to a lack of studies, we could not evaluate the best antibiotic choice for VAP, but carbapenems as a class may result in better clinical cure rates than other tested antibiotics.

**89 Enhancing Patient and Family Satisfaction Through Structured Communication**

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Background: A 2014 report from the Institute of Medicine discusses the role of healthcare workers in the provision of compassionate care. The report describes the need for improvement in end-of-life care through enhanced communication, professional education, person-centered care, and advance care planning. The purpose of this project was to utilize a palliative care trigger screening instrument to evaluate the current communication practices of the Critical Care Service. The pilot is part of a 3-phase evidence-based communication bundle project that provides a structure for the interprofessional care team to consider the needs and wishes of high-risk and critically ill patients and families and to identify patients in need of palliative care services in the intensive care unit (ICU).

Methods: Each patient ($n=50$) was assessed on ICU day 3 using a palliative care trigger screening instrument. Data were captured in an online survey instrument about patient characteristics and team communication.

Results: Results showed that documentation of a designated decision maker and advance directives often did not occur on ICU day 1, despite this documentation being part of the current end-of-life policy. No project patients had an advance directive documented in the chart. Code status was documented on most patients (91%) as a full code. Many patients had life-threatening illnesses (96%) and emotional/spiritual/relational (81%) and physical/psychological (98%) distress, but neither psychosocial nor spiritual support was routinely documented on day 3. Family discussions often occurred as a daily update in the patient's room but not as a structured meeting to define and discuss goals of care. The palliative care team was only consulted in 31% of cases, and consultation usually occurred close to the time of patient death.

Conclusion: Implementation of a structured method of communication with bundles may be beneficial in other healthcare settings as a method for standardizing language, eliminating uncertainty, and improving team collaboration.

90 Early Warning: Detecting Sepsis in Every Patient, Every Shift Requires Timely Vital Sign Documentation

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Background: Sepsis is a leading cause of death in the United States, and its incidence is expected to rise with an aging population. Cost estimates for the United States are approximately \$17 billion per year, with hospital care costs of approximately \$1,600 per day. The Centers for Medicare & Medicaid Services has defined quality and process measures for sepsis that include 3-hour and 6-hour bundles that are expected to improve outcomes. These new sepsis core measures, which include early recognition as a key feature, went into effect in the fourth quarter of 2015. The Modified Early Warning System (MEWS) is expected to improve sepsis recognition but is dependent on inputting timely documentation of vital signs in the electronic medical record.

Methods: A sepsis task force developed new protocols and order sets in March 2014 after new sepsis management evidence was published. Changes to patient data collection were then made to reflect the new measures, with particular emphasis on vital signs documentation to facilitate a trigger in the MEWS. Staff was educated on the new protocols/order sets, and interdisciplinary groups were engaged in redefining the process of care for sepsis management. Existing Epic projects involving MEWS were adapted to screen all inpatients for sepsis.

Results: Early results show that compliance with documentation of vital signs (at least 1 complete set of vital signs per shift) on 2 MEWS noncritical care pilot units improved from <20% at baseline to 100% 8 months later. In the month of January 2016, MEWS triggered a sepsis alert in 460 of 684 alerts on pilot units that generated a provider response resulting in a confirmed sepsis diagnosis.

Conclusion: Education and Epic modifications are thought to contribute to improved compliance in vital sign documentation and MEWS alerts. Longitudinal data are warranted to measure the relationship between MEWS alerts and increased sepsis recognition.

91 Tele-ICU: Creative Solutions to Healthcare Efficiency and Quality Improvement

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Background: The nationwide focus on improving quality outcomes and reducing waste has been the impetus for increased use of decision support and technological solutions. Studies suggest that telemedicine can improve intensive care unit (ICU) utilization, process, and outcomes through clinical practice transformation, risk stratification, advanced analytics, and benchmarking. We have leveraged tele-ICU to support clinical practice, improve documentation adherence, and provide opportunities for quality improvement.

Methods: Critical care and tele-ICU staff were provided training on TeamSTEPPS and evidence-based practice guidelines. Tele-ICU and ICU staff worked with documentation experts to make sure critical documentation elements were accurately captured. Additionally, clinical and operational leaders were educated on project management and outcomes methodology. The significance of detailed, accurate data capture on public reporting and reimbursement was also communicated. The interprofessional team leveraged communication, analytics, expert frontline clinical knowledge, and evidence-based practice to create a sustainable strategy to manage cardiac arrest. Evidence-based algorithms were used to decrease variation in practice.

Results: The percentage of system ICU cardiac arrests documented in the electronic medical record gradually increased from 35%-55% during 2014. The percentage of ICU cardiac arrests documented for the quaternary medical center in the system increased from 60%-80%. The quality of specific documentation elements also improved. Additional data analysis for patients experiencing cardiac arrest in the ICU included mortality rate (45%-90%), average APACHE (Acute Physiology and Chronic Health Evaluation) IV score on ICU admit (85-120), predicted hospital length of stay (LOS), actual vs predicted ICU LOS, and actual vs predicted ventilator LOS.

Conclusion: A targeted team approach to specific processes of care, such as code blue management using evidence-based guidelines, can improve efficiency, documentation adherence, and quality improvement.

92 Magnetic Resonance Perfusion for Distinguishing Tumor Recurrent from Pseudoprogression in Treated High-Grade Gliomas is Both Sensitive and Specific

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Background: In patients with treated high-grade gliomas, surveillance with brain magnetic resonance imaging (MRI) is often used to detect tumor recurrence. When new enhancement is identified, it is difficult to differentiate true tumor recurrence from posttherapy change based on conventional MRI alone. Magnetic resonance perfusion (MRP) is a readily available sequence that can be helpful in making this distinction and better guiding patient care. The purpose of this investigation was to determine the accuracy of MRP at this institution in differentiating tumor recurrence from pseudoprogression.

Methods: The PACS (picture archiving and communication system) was queried to identify MRP studies performed for tumor imaging from 2009-2013. Electronic medical records were reviewed, and patients with a diagnosis of high-grade glioma status post resection/chemoradiation were identified. Only patients with tissue pathology and/or at least 6 months of imaging follow-up were included. These studies were reviewed by one neuroradiologist who determined if findings were compatible with recurrent tumor or posttherapy change. Comparison was then made to pathology results or imaging follow-up.

Results: Twenty MRP studies were identified meeting inclusion criteria. Five were excluded because of suboptimal imaging. Of the remaining 15 studies, 8 (53.3%) demonstrated positive results (areas of elevated blood volume in the area of abnormal enhancement). Based on follow-up imaging and/or pathologic diagnosis, 7 of these were determined to be true positives with 1 false-positive (87.5% positive predictive value and sensitivity). The remaining 7 studies (46.7%) demonstrated negative results (normal/decreased blood volume in the area of abnormal enhancement), 6 of which were determined to be true negatives with 1 false-negative (85.7% negative predictive value and specificity).

Conclusion: Patients with treated high-grade gliomas and new enhancement often present a diagnostic challenge when evaluated with conventional MRI alone. MRP is a readily available sequence that is both sensitive and specific for determining true tumor progression from pseudoprogression.

93 Geographic Variation in Prevalence of Incidental Basal Ganglia Calcifications: A Comparison of Two Regions

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Background: Basal ganglia (BG) calcification is a common finding in neuroimaging of elderly patients. The majority of cases are idiopathic, with a prevalence reported in the literature of 12.5%. The authors suspected an increased prevalence of nonpathologic BG calcifications in New Orleans, LA, compared to other geographic regions in the United States as well as to the established prevalence in the literature. The purpose of this project was to establish the rate of incidental BG calcifications at Ochsner Clinic Foundation (OCF) and compare it to a separate geographic population at University of Maryland Medical Center (UMMC) in Baltimore, MD.

Methods: Two hundred consecutive noncontrast head computed tomography (CT) scans in patients >50 years were reviewed for the presence of intracranial BG and dural calcifications at both OCF and UMMC following institutional review board approval. Each head CT was reviewed by a single board-certified neuroradiologist at each institution. Patients with BG hemorrhage were excluded. The prevalence of BG and dural calcifications at both of these institutions was compared using the chi-square test.

Results: The rate of BG calcifications at OCF was 32.3%, more than double the rate at UMMC (15.5%). This difference was statistically significant ($P < 0.001$). In comparison, the rate of dural calcifications was not significantly different: 55% at OCF and 50% at UMMC ($P = 0.3$). Additionally, the rate of BG calcifications at OCF was higher than the reported rate in the literature of 15.5%.

Conclusion: There is a statistically significantly higher rate of BG calcification at OCF than at UMMC, while the rate of dural calcification is similar. We suspect that various demographic, clinical, or environmental factors may contribute to this finding. While the clinical importance of idiopathic BG calcifications has not been determined, the rate of BG calcifications is worthy of further consideration and study, particularly given the significant regional variance.

94 Elevated Lung Shunt Fraction as a Prognostic Indicator for Local Disease Progression and Metastasis in Hepatocellular Carcinoma

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95 Extended Sonographic Surveillance After Stenting for Hepatic Artery Stenosis

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96 The Role of Circulating T Follicular Helper Cells in the Pathogenesis of Rheumatoid Arthritis: Autoantibody Production and Proinflammation

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Background: Rheumatoid arthritis (RA) is an autoimmune disease characterized by the presence of autoantibody and chronic inflammation in synovium that leads to progressive joint destruction and patient disability. Recently, Tfh cells and Th17 cells have emerged as novel T cell subsets controlling autoimmunity. Tfh cells play an important role in antibody production by secreting IL-21, whereas Th17 cells are involved in inflammation by secreting IL-17. We have previously shown that circulating Tfh cells (cTfh) and cTh17 cells are accumulated in patients with moderate/severe RA. However, their role in RA pathogenesis is largely unknown. We investigated the correlation of the cTfh and cTh17 cells with clinical parameters and examined the serum levels of IL-21 and IL-17 in patients with RA.

Methods: Peripheral blood was collected from 59 RA patients meeting 2010 American College of Rheumatology/European League Against Rheumatism classification criteria and from age-/gender-matched healthy donors. Clinical disease activity was quantified using the Disease Activity Score in 28 joints (DAS-28). Clinical parameters including rheumatoid factor, anti-cyclic citrullinated peptide antibody (anti-CCP), erythrocyte sedimentation rate, and C-reactive protein (CRP) levels were obtained. The frequencies of cTfh cells (CD4⁺CXCR5⁺ICOS⁺) and cTh17 cells (CD4⁺CCR4⁺CCR6⁺) were measured by flow cytometry. Serum levels of IL-21 and IL-17 were detected by ELISA.

Results: Both cTfh and cTh17 cells were significantly increased in patients with moderate/severe RA compared to healthy donors ($P < 0.05$). The frequency of cTfh cells correlated with the level of anti-CCP antibody ($P < 0.01$), whereas cTh17 cells only correlated with the level of CRP ($P < 0.05$). The serum level of IL-21 was significantly increased in patients with RA and correlated with the percentage of cTh17 cells ($P < 0.05$).

Conclusion: Circulating Tfh cells may be involved in RA pathogenesis by secreting IL-21, which may induce generation of plasma cells producing autoantibody, and also by steering T cells to differentiate into Th17 cells secreting the proinflammation cytokine IL-17. Targeting cTfh cells may inhibit both autoantibody production and inflammation, providing more effective strategies for patients with RA.

97 Best Practices in Managing Patients with Rheumatoid Arthritis

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Background: Patients who have rheumatoid arthritis (RA) with high disease activity have increased morbidity and mortality. As a result, we evaluated the use of disease-modifying antirheumatic drugs (DMARDs) in the RA population, implemented a departmentwide documentation of RA disease activity at each patient encounter, and improved documentation of functional status.

Methods: Ochsner is using the RAPID3, Disease Activity Score 28 (DAS-28), or Clinical Disease Activity Index (CDAI) instrument to monitor a patient's disease activity level during each clinic visit. Individuals with a diagnosis of RA were identified from data obtained from Epic from July 1, 2013, to June 30, 2014. We surveyed the use of DMARD therapy, the measure of disease activity (RAPID3, DAS-28, or CDAI), and the recording of health assessment questionnaire (HAQ) scores in this patient population. Our medical assistants recorded HAQ scores for all our patients.

Results: Our baseline DMARD therapy was >90%, but documentation of disease activity was 36.8% and HAQ score was 45.4%. After educating our providers, we were able to maintain our DMARD therapy at >90% and increase the documentation of HAQ and disease activity measures in each quarter. From July 1, 2014, to June 30, 2015, our DMARD therapy was 92.1%, documentation of disease activity was 95.9%, and documentation of HAQ score was 95.2%.

Conclusion: We also created an early-onset RA screening questionnaire for our primary care providers. Unfortunately, Ochsner's primary care providers were overwhelmed with competing disease screens and felt uncomfortable in detecting RA. To help capture early-onset RA patients for our primary care providers, we created an order set in Epic that allowed patients to be seen within 2 weeks in our arthritis clinic along with essential labs prior to visit. In addition, we created a pre-DMARD order set to help facilitate our providers in ordering essential labs as well as vaccination review and administration.

98 Single Institution Experience With Neoadjuvant Treatment of Borderline Resectable Pancreatic Adenocarcinoma: Achieving R0 Resection With Modern Chemotherapy

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Background: Patients with borderline resectable pancreatic cancer (BRPC) are at high risk for margin-positive resection. In this group, neoadjuvant treatment strategies have been adopted to improve patient selection for surgery and increase R0 resection rates. We report our experience with neoadjuvant chemoradiotherapy (NCT) for patients with BRPC requiring pancreaticoduodenectomy.

Methods: Data were collected retrospectively on patients with adenocarcinoma of the head of the pancreas from January 1, 2008, to September 30, 2013. Demographics, intraoperative blood loss, intensive care unit (ICU) stay, total hospital stay, postoperative complications, and rates of R0 resection were examined. Outcomes were compared between the NCT and immediate surgery (IS) groups. The American Hepato-Pancreato-Biliary Association/Society of Surgical Oncology/Society for Surgery of the Alimentary Tract consensus conference definition of borderline resectable was used.

Results: Of 220 patients analyzed, 30 patients were classified as BRPC and underwent NCT. There was a trend toward increasing use of NCT in recent years. Baseline demographics and preoperative albumin levels were similar in the NCT and IS groups. Intraoperative blood loss was significantly higher in the BRPC group (mean=1,441 cc) than in the IS group (mean=686 cc). There were no significant differences in postoperative complication rates including wound infection, anastomotic leak rate, intraabdominal abscess formation, or fistula formation. Hospital length of stay ($P=0.064$) and ICU days were similar between the groups. The rate of R0 resection did not differ between the groups (IS 86.9% vs BRPC 90%), suggesting that the use of NCT increased the probability of margin-negative resection in the BRPC group.

Conclusion: The postoperative outcomes of BRPC patients who underwent NCT did not differ from those of their IS counterparts despite later presentation/more aggressive tumor biology. The increase in intraoperative blood loss in the BRPC group reflects the increased complexity of vascular resections to achieve negative margins. The high rate of R0 resection indicates the efficacy of current chemotherapy regimens in the neoadjuvant setting.

99 A Review of Unplanned Readmissions Within 6 Months From the Primary Implant Hospitalization for Mechanical Circulatory Support Device with a Low Socioeconomic Patient Population

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Background: The readmission rate for patients receiving a mechanical circulatory support device (MCSD) was 81% within 6 months of primary implant hospitalization. An analysis of the first inpatient readmissions postimplant was reviewed to determine primary readmission diagnosis, social support, and socioeconomic status. The intent was to develop an understanding of the MCSD patient population and possible correlations between unplanned readmission compared to patients who were not admitted within 6 months of primary implant hospitalization.

Methods: A retrospective INTERMACS registry review was performed for patients implanted with a MCSD from 2014 to 2015 Q1/Q2. The primary implant population (n=58) excluded pediatric patients, MCSD exchange patients, and those who expired during the initial implant hospitalization.

Results: Detailed analysis of initial unplanned readmissions noted differences among patients readmitted within 30 days and those who were not admitted within 6 months. Characteristics of patients not admitted within 6 months included a higher percentage of males, married >59 years, Medicare beneficiary, higher level of household income, and a greater percentage who attended college and/or technical school. Patients readmitted within 30 days were younger (40-59 years), a lower percentage was married, higher percentages had commercial insurance and grade school education, and this group had the lower household income.

Conclusion: Review of the primary patient population demographics supported the need for the addition of a part-time social worker to counsel patients during MCSD clinic visits and to work closely with the financial aid coordinator to assist patients with obtaining maximum benefits and seeking resources within their communities. Understanding the primary readmission diagnosis led to assigning an outpatient pharmacist to monitor and adjust warfarin doses for the MCSD patient population, as well development of an outpatient enoxaparin protocol for subtherapeutic values to be implemented. An intangible factor that was not represented because of subjectivity—caregiver support—was higher among patients not readmitted within 6 months of initial implant hospitalization.

100 Early Outcomes Following Implementation of a Multimodal Intervention Program to Reduce Falls in Medical/Surgical Patients

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Background: One in 3 adults, age 65 years and over, falls each year, contributing to functional decline. This further contributes to additional falls and the loss of ability to perform activities of daily living, including ambulating independently. Hospital falls are frequently attributable to delays in providing assistance with toileting and ambulation. The aim of this project was to reduce the fall rate on 2 medical/surgical units using a multimodal intervention program focusing on improving the patients' perception of staff responsiveness to calls for help.

Methods: A Plan-Do-Study-Act methodology was used to develop and implement an evidence-based fall risk guideline on Units 4B and 5A that included (1) a fall prevention educational brochure; (2) a contingency fall contract between nurse/patient regarding fall prevention strategies; (3) mobility/activity circles (in-room communication about fall risk and activity); (4) structured hourly rounding addressing 4 Ps (pain, potty, position, personal belongings) to proactively reduce the need for patients to get up without assistance; and (5) a mobility tech program (a technician ambulated patients 3 times a day) that was initiated only on Unit 4B.

Results: During 7 months of observation, the fall rate on 4B decreased from 5.69 falls/1,000 patient days (June) to 3.93 (December) and increased on 5A from 1.45 falls/1,000 patient days (June) to 6.8 (December). Patients' perception of satisfaction with staff responsiveness on the Hospital Consumer Assessment of Healthcare Providers and Systems survey increased from 8 in Quarter 2 to 23 in Quarter 4 on the unit (4B) that used the mobility tech program, and Unit 5A scores increased from 0 to 6 in quarter 4 (5A did not have the mobility tech program).

Conclusion: Although the observational period is insufficient to make a conclusion, preliminary findings suggest that the addition of the mobility tech program on 1 unit may be contributing to reducing the fall rate. Longitudinal measurement of outcome data is warranted.

102 Safety and Efficacy of Ledipasvir/Sofosbuvir With or Without Ribavirin for Treatment of Recurrent Hepatitis C Infection Post-Liver Transplant

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Background: Hepatitis C (HCV) is the most common indication for liver transplant in the United States, representing more than 40% of all recipients. The availability of oral direct-acting antivirals has provided the potential for dramatic improvements in management of recurrent HCV post-liver transplant. More information is needed regarding complications and HCV ribavirin clearance with these agents.

Methods: A retrospective study was conducted of liver transplant recipients treated with ledipasvir/sofosbuvir (LS) ±RBV for recurrent HCV. Thirty liver transplant recipients, transplanted between January 2014 and June 2015, were assessed. All patients received either 12 or 24 weeks of treatment. Rates of SVR12 (sustained viral response at 12 weeks) and biopsy-proven acute rejection (BPAR) were documented. Patients were also assessed for response at end of treatment (EOT), side effects, drug discontinuation, and changes in immunosuppression.

Results: Patients were mostly male (83.3%) with mean age of 58.5 years. Eight patients (27%) had been previously treated with interferon therapy. Most patients (97%) had genotype-1A virus. Nine patients (30%) received ribavirin. Median time from transplant to treatment was 146 days (range, 37-421 days). All patients completed at least 4 weeks of treatment, and 77% completed 12 or 24 weeks. SVR rate was 100% among patients with 12 weeks of posttreatment follow-up (n=11). EOT response was 91.3% (n=23) and was not significantly affected by use of ribavirin (100% vs 88%, $P=0.56$). Mild BPAR occurred in 10% of patients. Common adverse effects were headache (20%), anemia (20%), and fatigue (17%); one patient discontinued RBV. No significant change was noted in glomerular filtration rate or immunosuppression during treatment. Seven patients are under treatment, and 12 are awaiting follow-up.

Conclusion: LS is a safe and effective treatment for HCV recurrence post-liver transplant with excellent rates of HCV cure. This regimen is well tolerated with mild side effects and does not appear to increase rates of BPAR. Given these results, LS can be a first-line therapy for genotype-1 HCV recurrence post-liver transplant.

103 Traumatic Urethral Catheterization: A Review of Inpatient Urologic Consultations at a Tertiary Care Center

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104 Our Relationship with Consulting Providers – Knowing Is Half the Battle

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Background: Urologic consultations often do not require inpatient intervention, and an argument by urologists exists for more outpatient evaluation. In an increasingly multidisciplinary patient care environment, knowledge of our consultants' concerns is increasingly relevant, however. We report an analysis of 2 years of inpatient consultation data and establish a baseline from which to improve our own efforts.

Methods: After obtaining institutional review board approval, all adult inpatient, nonintraoperative urologic consultations between January 2013 and January 2015 were identified and retrospectively reviewed. Data were analyzed based on referring department, reason for consultation, and whether a subsequent intervention was performed.

Results: A total of 1,600 consultations met the criteria. More than half (n=907, 56.7%) of the total urologic consultations received were from a medical specialty, the majority (n=776, 86%) ordered by hospitalists. The most common reasons for consultation from a medical specialty were gross hematuria (n=163, 27%), infection (n=158, 20%), urinary retention/benign prostatic hyperplasia (BPH) (n=126, 16%), catheter issues (n=100, 12%), and iatrogenic injury (n=65, 7%). Four hundred eight (25.5%) received were from the emergency department. There were 102 (25%) upper tract obstruction, 80 (20%) infection, 63 (15%) gross hematuria, and 37 (9%) postoperative issues. Two hundred sixty-nine (16.8%) of the urologic consultations were received from surgical subspecialties, with the most common reasons for consultation being urinary retention/BPH (n=67, 25%), upper tract obstruction (n=43, 16%), catheter issues (n=32, 12%), and genitourinary-related pain (n=24, 9%). The most common surgical subspecialties ordering urologic consultations were general surgery with 132 (8% of total) consults. Four hundred fifty-nine (28.6%) of consults received required subsequent intervention.

Conclusion: We have identified the most common consulting departments, most frequent reasons for consultations, as well as the likelihood of inpatient intervention. Most consultations have not required intervention. Having established a baseline, we may begin to target resources and improve patient management even prior to consultation specific to consultant subgroups.

105 Inpatient Urologic Consultations – Where Do We Stand?

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Background: Urologists as surgical subspecialists have the responsibility of consultation services. While common, they are typically unplanned. To improve efficiency and ultimately provide quality patient care, we must understand our full scope of practice. While the pattern of inpatient consultations has been reported in other surgical subspecialties, data regarding urologic consultations are limited. A single institution in Ireland has published an overall experience. To our knowledge, there has been no report on a similar pattern of adult urology consultation at any institution in the United States.

Methods: After obtaining institutional review board approval, adult urologic consultations between January 2013 and January 2015 were identified and retrospectively reviewed. Demographic, clinical, and interventional data were abstracted. The data were analyzed based on patient demographics, referring department, reason for consultation, frequency of consultation, and subsequent intervention.

Results: A total of 1,600 inpatient consultations were received during the 2-year period. The patient cohort was 66% male with a mean age of 61 years. Fifty-nine percent of referrals were from medical subspecialties, 26% from emergency medicine, and 15% from surgical subspecialties. Gross hematuria-related issues resulted in 17% of consultations, upper tract hydronephrosis in 17%, infectious etiologies in 17%, lower urinary tract/benign prostate-related issues in 16%, catheter-related issues in 11%, and genitourinary malignancy in 7%, with the remaining reasons for consultation summing to <5% each. Iatrogenic gross hematuria alone resulted in 8% of consultations. Eleven percent of patients were seen on multiple admissions. Only 29% of consultations resulted in urologic intervention (procedural or operative).

Conclusion: We report the epidemiology of consultations at a high-volume tertiary care academic center to shed light on an otherwise poorly studied, albeit large portion, of routine urologic practice. The analysis provides an understanding of our patient population and allows for the identification of the current and prediction of the future trends for our department.

106 Fetal Respectful Disposition

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Background: According to Louisiana state law, a miscarried fetus ≤ 20 weeks is defined as a medical specimen. The remains are in the possession of pathology and are to be addressed by the hospital, but parents are given the option to bury privately, an expense that is not legally required. At a time when parents experience profound loss, healthcare facilities have an opportunity to offer an alternative and respectful option. In 2015, the Neonatal Palliative Care committee created a task force to develop a process to retain fetal products of conception and establish a quiet collective interment of the remains twice yearly.

Methods: Using the Plan-Do-Study-Act methodology, the following cycles were implemented to create the Fetal Respectful Disposition (FRD) program: Plan—collaborated interprofessionally to develop processes to retain fetal products and procure burial space; Do—implemented a structured guideline to inform parents of the FRD program and obtain consent, procure and maintain fetal products within the facility, coordinate transfer of fetal products to the cemetery, and conduct a twice yearly collective quiet burial to commemorate the fetal lives lost; Study—measured program success by the number of families that consented to participate in the FRD program divided by the number of fetal miscarriages (follow-up phone calls are in progress to assess parent perceptions of the FRD program); Act—continue to work on improving communication processes within the team, with parents, and with community collaborators.

Results: The FRD program began in January 2015. To date, 13 of 15 (87%) parents consented to participate, and 2 families opted for private burial/cremation. Initial feedback has been resoundingly positive and appreciative.

Conclusion: In this facility, the majority of parents experiencing fetal loss ≤ 20 weeks are interested in respectful disposition of the remains. Supportive programs such as the FRD provide closure and respect, positively impacting healing and recovery for the parents, families, and healthcare staff.

107 A Review of Barbecue-Associated Pediatric Burns in Southeast Queensland, 2013-2015

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Background: Globally, children ages 0-4 years have the highest incidence of all types of burn injuries. The literature regarding barbecue burns exclusively (not including campfires, bonfires, or other outdoor fires) consists of 2 pediatric studies (including 1 from this center) and 1 adult study. In adults, barbecue burns are commonly related to the use of accelerants to initiate ignition, resulting in flame or flash burns. In contrast, contact burns constitute the overwhelming majority of pediatric barbecue-related burns.

Methods: The aim of this study was to quantify and describe the characteristics of burns in children caused by or associated with barbecues. The study includes children who presented to Lady Cilento Hospital in Brisbane, Australia (previously Royal Children's Hospital) between January 2013 and April 2015 with a burn because of or associated with barbecue use.

Results: Thirty-eight children were identified, representing 2.2% of all burn presentations for that period. The median age was 2.7 years with a male to female ratio of 2.8:1. The majority of burns were classified as contact burns (n=34, 89%) in which the child directly touched or was placed on a hot surface. Other mechanisms identified included scald burns (n=3, 8%) and flame burns (n=1, 3%). Two children required skin grafting, and the median total body surface area (TBSA) affected was 0.5%. Eleven of the 38 burns (29%) occurred at public parks where barbecues with no ignition safety mechanism were readily accessible. Given the temperate climate of southeast Queensland, there was little seasonal variation of burn presentation.

Conclusion: Pediatric burns from barbecues are a preventable injury. The number of presentations of barbecue-associated burns has increased. While most of these injuries occur in the home setting, public barbecues with no child safety mechanism are the second most common source of these burns.

108 Acute Pericarditis From Postoperative Complications of Pacemaker Placement as a Cause for New-Onset Heart Failure

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Background: After evacuation of blood from hemopericardium, inflammation may persist and lead to development of pericardial adhesions. Free wall motion may become limited, leading to new-onset heart failure. Treatment of pericardial inflammation may be curative in these situations.

Case Report: An 89-year-old female underwent placement of a transcatheter aortic valve for severe aortic stenosis complicated by development of a new left bundle branch block necessitating pacemaker placement. During the procedure, she experienced right ventricular perforation with hemopericardium and tamponade. Seven days after effusion resolution, she experienced orthopnea, edema, and a 12-lb weight gain. She was treated with furosemide/bumetanide and was discharged with instructions for diet, daily weights, and diuretic titration. During the next 20 days, she experienced 4 readmissions for fluid overload. This pattern continued until day 31, when after 2 days of diuresis, detailed precordial auscultation demonstrated a 2-component pericardial friction rub. Review of the patient's echocardiographic history showed normal left ventricular function, ejection fraction (EF) of 55%-60% with E/e' of 10 and left atrial volume index of 58.66. Subsequent admissions for heart failure demonstrated severely increased right atrial pressures and EF of 70%. Review of these studies identified an area of fixed wall motion in the right ventricle visualized in the parasternal long axis. The patient was started on colchicine. She maintained her dry weight for a further 3 days before discharge. At 1-month follow-up, repeat studies demonstrate a return to EF of 50%-55% and normal right atrial pressures. She tolerated the therapy well and has had no further episodes of heart failure exacerbation, now 46 days later.

Conclusion: This case demonstrates the necessity of clinical reevaluation and physical examination, particularly after subsequent readmissions for heart failure. Subtle clinical findings and review of prior imaging may prove beneficial in patients with frequent readmissions.

109 Diagnosis and Therapeutic Management of Hypothyroidism-Induced Cholesterol Pericarditis

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Background: Cholesterol pericarditis is a rare cause of pericardial effusion defined by the presence of cholesterol crystals in the pericardial fluid and reactive pericardial cells with foreign-body giant cells. The etiology of cholesterol pericarditis remains unknown because of its infrequency.

Case Report: A 37-year-old male with no medical history presented with 6 months of progressive weakness, dyspnea, and weight gain (35 lbs in 1 month). Four days prior to admission, routine studies demonstrated hypothyroidism, and he was started on levothyroxine. On the evening of presentation, he experienced profound worsening of dyspnea, palpitations, and weakness with associated scrotal and lower extremity edema. Chest x-ray demonstrated a markedly enlarged cardiac silhouette. Echocardiogram demonstrated a large circumferential pericardial effusion, with right ventricle collapse, and respiratory variation on mitral inflow consistent with acute pericardial tamponade requiring urgent pericardiocentesis. Pericardiocentesis yielded 2,650 mL of serous fluid containing cholesterol crystals (48 mg/dL; serum cholesterol = 99 mg/dL) and giant foamy macrophages. A pericardial drain was placed and maintained for 6 days. He was started on intravenous furosemide and diuresed a net negative 44.1 L. Computed tomography imaging of the chest did not identify damage to the thoracic duct; his HIV, PPD, and rheumatoid factor tests were negative. Serial echocardiographic studies demonstrated resolution of the effusion without reaccumulation. He was discharged with levothyroxine, furosemide, and potassium. Subsequent follow-up has demonstrated no recurrence of pericardial effusion on echocardiogram at 3 months.

Conclusion: This case demonstrates the therapeutic management of cholesterol pericarditis with tamponade. Cholesterol pericarditis has been seen in combination with myxedema related to hypothyroidism, thoracic duct trauma, rheumatoid arthritis, and tuberculosis. Pericardial effusions associated with cholesterol pericarditis accumulate slowly but may progress to restrictive/tamponade symptoms and may recur. In cases of hypothyroid-induced cholesterol pericarditis, effective treatment involves therapy until euthyroid state is achieved.

110 **Batting a Thousand Is Critical for the Patient with a Sentinel Bleed From a Mycotic Primary Aortoenteric Fistula**

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Background: Primary aortoenteric fistulas (PAEFs) are a rare cause of gastrointestinal hemorrhage. They usually occur between the third part of the duodenum and the infrarenal aorta. Most PAEFs are associated with a fusiform abdominal aortic aneurysm with only a minority related to bacterial infections (mycotic aneurysms). We present a case of a mycotic PAEF with gastrointestinal hemorrhage.

Case Report: A 62-year-old female presented to the emergency department with epigastric pain, hematemesis, and shock. After volume resuscitation, an emergent esophagogastroduodenoscopy (EGD) showed fresh blood in the duodenum (second and third portions), but no bleeding source was found. Computed tomography (CT) angiography demonstrated an infrarenal abdominal aortic aneurysm with contrast extravasation into a periaortic collection measuring 7.4 × 9.1 cm. Emergent surgery was performed with identification and repair of a fistulous tract between the distal duodenum and the aneurysm. Multiple organisms (*Streptococcus anginosus*, *Prevotella intermedia*, and *Peptostreptococcus* spp) grew from the specimens collected intraoperatively. The patient was treated with a 6-week course of intravenous antibiotics and had a healthy recovery.

Conclusion: PAEFs are a universally fatal cause of gastrointestinal hemorrhage if left untreated. The mortality rate can be reduced to 30%-40% with early identification and emergent surgery. However, the diagnosis is often delayed in clinical practice because of the rarity of this condition. Sentinel bleeds have been described and need to be recognized for a timely intervention. Mycotic aneurysms can be insidious with no signs of sepsis until the life-threatening hemorrhage occurs. EGD is the natural first step in patients with hematemesis and melena, but the sensitivity for detecting PAEF is < 25%. CT angiography is the most useful diagnostic modality and should be performed without delay. Our case underscores the importance of maintaining a high index of suspicion and keeping PAEF in the differential of gastrointestinal hemorrhage despite negative EGD findings.

111 **Adult T Cell Leukemia/Lymphoma Causing Leukostasis with Multiorgan System Failure and Reversible Heart Failure**

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Background: Adult T cell leukemia/lymphoma (ATLL) is a rare and aggressive lymphoma linked to infection by the human T cell lymphotropic virus (HTLV-1 virus). It accounts for 10%-15% of all causes of non-Hodgkin lymphoma in the United States. Approximately 1 in 25 individuals infected with this virus is believed to eventually develop cancer.

Case Report: A 56-year-old African American male with a medical history of atrial fibrillation, hypertension, anemia, hyperthyroidism, pulmonary hypertension, and enlarged thoracic lymph nodes detected in 2012 with failure to follow-up presented with altered mental status, shortness of breath, weakness, and hypotension. Initial diagnostics demonstrated profound leukocytosis (white blood cell count [WBC] >440,000), thrombocytopenia, and marked electrolyte abnormalities. Further diagnostics identified disseminated intravascular coagulation, severe acute respiratory distress syndrome (PaO₂/FiO₂ = 72 mmHg), tumor lysis syndrome, acute kidney injury, systemic inflammatory response syndrome, global cardiac dysfunction with new heart failure (ejection fraction [EF] 25%-30%), and bilateral lower extremity elephantiasis nostra verrucosa. Flow cytometry demonstrated 97% blasts, CD19=2, CD45=100, CD33=96, CD34=99, CD7=99, CD11B=98, CD71=98, consistent with ATLL. HTLV-1 positivity was confirmed. This patient underwent leukapheresis and vincristine administration, resulting in leukocyte reduction (WBC=22,600). Repeat echocardiographic studies 5 days posttherapy demonstrated a return to normal global systolic function (EF 50%-55%). On day 5, the patient's family elected to discontinue treatment. He was extubated on day 6 and expired day 7.

Conclusion: During the patient's hospital course, 4 of the 5 hematologic emergencies were encountered. He demonstrated significant dysfunction in all major organ systems including central nervous system, respiratory, cardiac, renal, gastrointestinal, dermatologic, infectious disease, and hematologic as a result of his disease process and associated treatments. This case illustrates an example of leukostasis causing reversible heart failure that is rarely seen in clinical practice.

112 A Case of Urachal Carcinoma

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Background: Urachal carcinoma is a rare, nonurothelial carcinoma that represents <1% of all bladder cancers.

Case Report: A 58-year old male presented with a 1-week history of painless, gross hematuria. Physical examination revealed fullness at the dome of the bladder. Cystoscopy revealed a bladder mass, and subsequent biopsy of a liver mass confirmed the diagnosis of metastatic urachal adenocarcinoma. The patient received a chemotherapeutic regimen consisting of 5-fluorouracil, leucovorin, gemcitabine, and cisplatin (GEM-FLP) administered every 4 weeks. Restaging scans after 2 cycles showed a partial response, but scans after 4 cycles revealed progression. He was switched to second-line therapy that included cetuximab and irinotecan.

Conclusion: Urachal carcinoma is extremely rare, and accurate diagnosis is crucial, as there are critical differences in treatment and management compared to standard urothelial cancers.



113 An Extraordinary Response of Metastatic Renal Cell Carcinoma to an Unusual Regimen

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Background: The combination of bevacizumab, an antibody against vascular endothelial growth factor, and erlotinib, an epidermal growth factor receptor tyrosine kinase inhibitor, has been shown to be an effective chemotherapeutic regimen for patients with metastatic renal cell carcinoma.

Case Report: A 35-year-old female with metastatic renal cell carcinoma had undergone 3 different chemotherapy regimens, but her disease had progressed despite treatment, and her clinical condition had deteriorated to the point that she was confined to a wheelchair. We evaluated the patient and started her on bevacizumab and erlotinib. She has had a spectacular response to therapy and has achieved stable disease for the past 8 months. The only side effect from this therapy has been an acneiform rash. Her clinical condition has significantly improved; she no longer uses a wheelchair and can perform all activities of daily living.

Conclusion: The combination of bevacizumab and erlotinib is an uncommon but effective chemotherapy regimen for metastatic renal cell carcinoma. This case highlights the effectiveness of this regimen in a heavily pretreated patient.

114 Adult Pulmonary Blastoma: A Rare Primary Lung Malignancy

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Background: Pulmonary blastoma is a rare tumor that comprises <0.5% of all primary lung malignancies. Classic biphasic pulmonary blastoma found in adults histologically is composed of immature epithelial and mesenchymal tissue resembling embryonic lung tissue. Surgical resection is the optimal treatment. The role of adjuvant chemotherapy and radiation has not yet been validated; however, many case reports involve the use of platinum-based regimens with or without radiotherapy. Overall prognosis is poor, with an estimated 5-year survival of approximately 15%.

Case Report: A 26-year-old female presented with severe persistent cough, dyspnea, and chest pain. Chest computed tomography (CT) was significant for a 6-cm right upper lobe lung mass and significant mediastinal adenopathy resulting in compression of the trachea, aortic arch, and superior vena cava. The patient was not deemed to be a surgical candidate because of the size and location of the tumor. The patient has received 5 of 6 planned cycles of cisplatin and etoposide thus far. She has completed 6000 cGy of concurrent radiation. Her most recent chest CT showed a significant interval decrease in the size of the right upper lobe tumor to 3.4 cm, as well as a decrease in size of the necrotic-appearing mediastinal lymph nodes. Although the patient has struggled with chemotherapy side effects such as pancytopenia, fatigue, and gastrointestinal complications, overall, her dyspnea and chest pain have significantly improved.

Conclusion: Because of the rarity of this disease, limited data are available about the use of concurrent chemoradiation in unresectable cases. Our patient appears to be responding favorably to the current regimen, especially given the aggressive doubling time initially noted for her tumor.



115 Hepatocellular Carcinoma Presenting With Invasion Into the Inferior Vena Cava and the Right Atrium

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Background: Hepatocellular carcinoma (HCC) is relatively uncommon in the United States, and almost all cases are due to underlying chronic liver disease such as hepatitis B/C virus. Frequent sites of metastasis include lungs, bone, lymphatic system, and brain.

Case Report: A 33-year-old African American female with a medical history of asthma and chronic back pain presented with several months of abdominal pain and generalized swelling. The patient described the pain as moderate right upper quadrant (RUQ) pain with no alleviating or exacerbating factors. At presentation, vital signs were stable except for tachycardia. Physical examination was remarkable for scleral icterus, bibasilar crackles, abdominal distension with tenderness to palpation in the RUQ, hepatomegaly, and lower extremity edema. Review of systems was remarkable for dyspnea, chills, anorexia, and night sweats. Laboratory values were notable for anemia, elevated AST, total bilirubin, prothrombin time/international normalized ratio, and partial thromboplastin time. HCV Ab and HBsAg were positive. Computed tomography (CT) of the abdomen and pelvis showed diffusely metastatic hepatomegaly with near-complete replacement of the right lobe; the tumor was seen extending partially into both the portal vein and hepatic vein with encroachment into the inferior vena cava (IVC) and the right atrium and occlusion of the IVC. Chest x-ray showed multiple bilateral pulmonary nodules. CT thorax showed diffuse pulmonary metastatic disease with adenopathy. Two-dimensional echocardiogram showed tumor invading the right atrium. C-scope and EGD were unremarkable. Pt was admitted for management of pain and shortness of breath. Biopsy of the liver lesion was consistent with HCC.

Conclusion: Most cases of HCC are seen in older patients with longstanding liver disease; however, this patient did not have a prior diagnosis of cirrhosis or known history of hepatitis. This case was an unusual presentation of HCC in a young female because of the extensive tumor burden with pulmonary and intracardiac metastasis. Some cases of isolated cardiac metastases due to HCC have been reported; however, intracardiac involvement is usually rare and has a poor prognosis.

116 Patient With New-Onset Right Upper Quadrant/Right Flank Pain for 1 Week

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Background: Renal cell carcinoma (RCC) accounts for 90%-95% of malignancies originating from the kidney. The exact cause is unknown, although smoking, higher body mass index, and blood pressure are risk factors known to increase likelihood of disease.

Case Report: A 51-year-old male with a medical history of diabetes mellitus type 2, hypertension, and hyperlipidemia presented to the emergency department (ED) with 1 week history of right upper quadrant (RUQ) pain. The patient described the pain as severe (10/10), radiating to the right flank, and exacerbated by certain positions with no alleviating factors. The patient had been recently seen in the ED for chest pain and was diagnosed with musculoskeletal pain. At presentation, the patient's vital signs were stable. Physical examination was remarkable for RUQ and right flank tenderness to palpation. Review of systems was remarkable for chills, unintentional 15-lb weight loss in 1 month, and night sweats. Laboratory values were notable for anemia and hyperglycemia. Chest x-ray showed faint nodular densities in the right lower lobe and chronic lung changes. Abdominal ultrasound showed some fatty infiltration of the liver but was otherwise unremarkable. Based on symptoms, a computed tomography (CT) renal stone study was done that showed 7 × 8-cm left renal tumor mass with punctate calcifications and associated metastatic disease to the lumbar and pelvic regions. Further imaging showed diffuse metastatic disease involving the humeral head, throughout thoracic spine, and numerous upper and lower lobe pulmonary metastasis on CT thorax. The patient was admitted for management of intractable pain and was subsequently discharged for follow-up with urology and hematology/oncology.

Conclusion: RCC has an incidence of approximately 63,000 new cases each year. This case illustrates the importance of a high index of suspicion for accurate diagnosis. Incidence and improved survival have been increasing in the United States because of the use of imaging modalities that allow earlier detection of these tumors at smaller sizes. Tobacco abuse was more associated with more advanced disease at presentation as was seen in this patient.

117 Crouching Tiger, Hidden Dragon: Cancer Immunotherapy With Checkpoint InhibitorsQuretul Quresh, MD¹, William E. Davis, MD^{1,2}, Robert J. Quinet, MD^{1,2}¹Department of Rheumatology, Ochsner Clinic Foundation, New Orleans, LA²The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Pembrolizumab, a humanized monoclonal antibody, blocks the interaction between programmed cell death-1 (PD-1) expressed by tumor-associated T cells and its PD-1 ligand (PD-L1) present on tumor and stromal cells and is given to patients with metastatic malignant melanoma. We report the first case of subacute polyarticular inflammatory arthritis in a patient receiving this cancer immunotherapy.

Case Report: A 62-year-old female with metastatic malignant melanoma who had been unsuccessfully treated with oral vemurafenib followed by 4 cycles of ipilimumab was initiated on pembrolizumab. Three months later, she developed generalized polyarthritis and was referred to the rheumatology clinic. She was noted to have tender synovitis of all her proximal interphalangeal joints, metacarpophalangeal joints, and wrists, including the ulnar styloid. Rheumatoid factor, antinuclear antibody, and anti-cyclic citrullinated peptide antibody were negative, and she had elevated erythrocyte sedimentation rate and C-reactive protein. X-rays showed degenerative osteoarthritis of the knees; no erosions were noted in her hands or feet. Her polyarticular inflammatory arthritis was attributed to anti-PD-1 therapy, and she was started on hydroxychloroquine (Plaquenil) and low-dose prednisone therapy with resolution of her symptoms.

Conclusion: Anti-PD-1 monoclonal antibodies are immune checkpoint inhibitors that enhance T cell immune function and overcome the host T cell immune tolerance in melanoma and in non-small cell lung and renal cell cancers. The optimal duration of therapy with anti-PD-1 is unknown. Adverse immune-related toxicities, including pneumonitis, colitis, hepatitis, endocrinopathy, and nephritis, have been reported. We hypothesize that anti-PD-1 therapy may trigger autoimmunity by suppressing regulatory T cells and thus allowing autoimmune T cell clones to escape tolerance or downregulation. Clinicians should be aware of this rare potential complication of anti-PD-1 immunotherapy. Additional research is required to have better understanding of autoimmunity as we use this powerful and innovative strategy in cancer therapy.

118 Accidental Atropine Eye Drop Ingestion Leading to Anticholinergic ToxidromeTrung Tran, MD¹, Roland Estaris, MD¹, Colin Fee, MD²¹Department of Internal Medicine, Ochsner Clinic Foundation, New Orleans, LA²Department of Hospital Medicine, Ochsner Clinic Foundation, New Orleans, LA

Background: Atropine, an antimuscarinic alkaloid, is a competitive antagonist of the acetylcholine receptor and is currently used for inhibiting salivation and treating organophosphate toxicity and eye conditions such as mydriasis and uveitis.

Case Report: A 43-year-old male with a history of hypertension and recent bilateral retinal detachment was traveling to a wedding and was acutely agitated and delirious in the airport. In the emergency department (ED), he was hypertensive (164/94 mmHg), tachycardic (124 bpm), tachypneic (24 bpm), and hyperthermic (101.5°F). His pupils were dilated and sluggish at 6 mm; skin was dry and warm. Alcohol level was 97, and drug screen was negative. An empty 5 mL bottle of atropine eye drops was found in his possession. Family reported that he had seen an ophthalmologist several days prior and was prescribed atropine, ofloxacin, and prednisolone. The immediate concern was for anticholinergic toxidrome, and the ED staff contacted Poison Control. Initially, he received 1 mg intravenous of physostigmine and lorazepam, and his agitation improved. One hour after the administration of physostigmine, the patient became altered again, so an additional 2 mg physostigmine was given. The patient received 2 additional doses of 2 mg physostigmine for a total of 7 mg during the course of 8 hours. His confusion resolved. He was transferred to the medical intensive care unit and started on a dexmedetomidine drip and airway monitoring. The next day, all of his symptoms resolved. He recalled accidentally spilling the atropine into his beer at the airport and then drinking the beer. He was discharged that day to attend the wedding.

Conclusion: Acute confusion and delirium are frequently caused by substance abuse. However, this patient's physical findings along with atropine use pointed to anticholinergic syndrome. The timely use of physostigmine helped this patient avoid serious complications. This case highlights the danger of atropine eye drops and their potentially fatal side effects.

119 Where Supplements Can Go Wrong: Hypervitaminosis Due To Cholecalciferol

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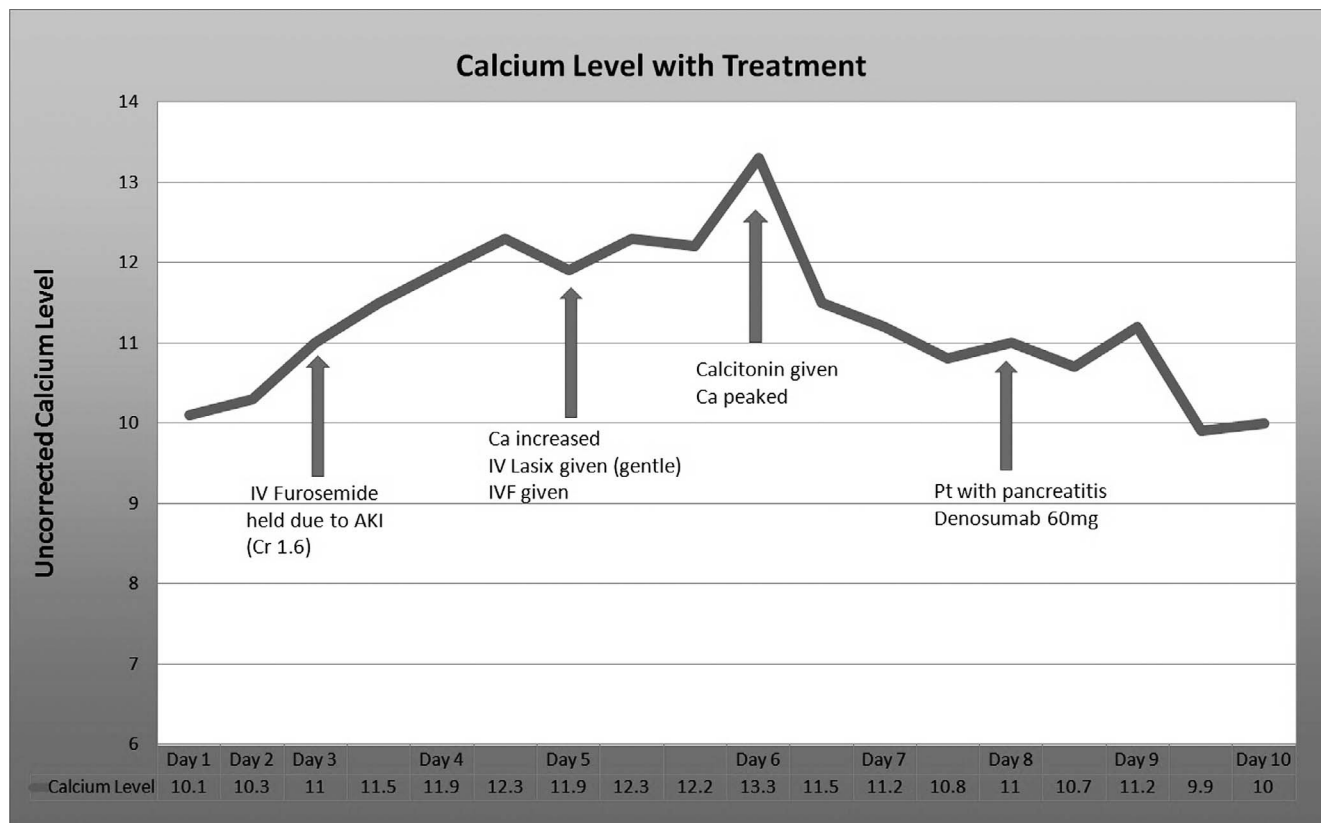
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Background: Hypercalcemia has multiple causes, the most common being primary hyperparathyroidism and malignancy. With the increasing incidence of vitamin D insufficiency, vitamin D supplements have become a popular over-the-counter medication. However, the numerous available dosages and formulations (D2 vs D3) can lead to confusion among consumers.

Case Report: A 71-year-old female with a history of chronic obstructive pulmonary disease (COPD), coronary artery disease, congestive heart failure (CHF), and stage 3 chronic kidney disease (CKD) was admitted with 4 days of generalized weakness and shortness of breath. Vital signs were significant for a respiratory rate of 20 bpm, and her oxygen saturation was 94% on 3 L nasal cannula. Bibasilar rales and lower extremity edema were present. Chest x-ray was consistent with fluid overload. The patient had a corrected calcium of 11 mg/dL, a phosphorus of 2.8 mg/dL, and creatinine of 1.2 mg/dL on admission. She was initially treated for CHF exacerbation and COPD exacerbation. A daily trend of increasing serum calcium levels was noted up to a peak of 14.7 mg/dL. The patient had a 25-hydroxycholecalciferol of >96 ng/mL, 1,25-dihydroxycholecalciferol of >156 pg/mL, and a parathyroid hormone level of <5.0 pg/mL. Upon further questioning, we learned that she had been prescribed vitamin D2 50,000 IU per week, but her pharmacy was giving her vitamin D3 50,000 IU daily. Her hospitalization was complicated by acute pancreatitis (lipase of 753 U/L) and acute kidney injury related to hypercalcemia. She was started on calcitonin (4 U/kg), intravenous (IV) fluids, IV furosemide, and denosumab 60 mg subcutaneously. Her calcium decreased to 10.7 mg/dL corrected on discharge.

Conclusion: Vitamin D toxicity is a rare condition caused by ingestion of excessive amounts of Vitamin D. In this case, bisphosphonates were contraindicated because of CKD, steroids were not possible because of pancreatitis, and so denosumab was used. This case highlights the importance of greater monitoring of supplements marketed to the public.



120 Myocarditis Secondary to Presumed ThyrotoxicosisAtalie M. Lim, BS¹, Badr Alsaleh, MD²¹The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA²Department of Internal Medicine, Ochsner Clinic Foundation, New Orleans, LA

Background: Myocarditis can have various presentations, ranging from chest pain to cardiogenic shock, fatal arrhythmia, and death. The most common cause of myocarditis is viral infection; however, other etiologies include bacterial infections, medication-induced myocarditis, and autoimmune diseases. Only a few cases of myocarditis secondary to thyrotoxicosis have been reported.

Case Report: A 38-year-old African American female who had a medical history of hyperthyroidism and was noncompliant with her medication, presented with acute onset of severe chest pain that radiated to her left arm. She reported a 30-lb unintentional weight loss over several weeks, heat and cold intolerance, and palpitations. Physical examination revealed sinus tachycardia and thyromegaly without tenderness or nodules. Further investigations revealed undetectable thyroid-stimulating hormone, elevated FT4 and FT3, and serial troponins trending up to >45.96. Electrocardiogram showed diffuse ischemic changes. Cardiac catheterization showed normal coronary arteries. Echocardiogram revealed left ventricular (LV) dysfunction with ejection fraction of 30% and severe global wall motion abnormalities. Basic autoimmune workup including antinuclear antibody test, C3, C4, and rheumatoid factor was unremarkable. We treated the patient with methimazole and high-dose glucocorticoids, in addition to angiotensin-converting enzyme inhibitors for LV dysfunction. With these medications, the patient's symptoms improved, chest pain subsided, and troponins started to trend down. The patient was discharged from the hospital with a plan to follow up with the endocrine and cardiology clinics.

Conclusion: This patient presented with symptoms concerning for ischemic cardiac disease; however, this diagnosis was unlikely as her angiogram was normal, so myocarditis was highly suspected. The patient did not report any recent infections or starting any new medications. Although thyrotoxicosis-induced myocarditis is less common and relatively rare in comparison to infectious etiologies, because this patient had markedly abnormal thyroid function, we attributed the cause of her myocarditis to thyrotoxicosis.

121 An Unusual Case of Bilateral Hand Swelling: Unraveling the MysteryQuretul Quresh, MD¹, William E. Davis, MD^{1,2}, Robert J. Quinet, MD^{1,2}¹Department of Rheumatology, Ochsner Clinic Foundation, New Orleans, LA²The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

122 Calciphylaxis in a Kidney Transplant Patient on Cinacalcet Successfully Treated With Subtotal Parathyroidectomy

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Background: Patients with end-stage renal disease (ESRD) suffer from secondary hyperparathyroidism (2HPT). These patients are treated with phosphate binders, vitamin D, and calcimimetics (cinacalcet). Complications of 2HPT usually resolve after a kidney transplant. Calciphylaxis is a rare complication of 2HPT in which calcium deposits in arteries. Calciphylaxis carries a poor prognosis because of nonhealing wounds and secondary infections. We report a case of a kidney transplant patient who developed calciphylaxis despite being on cinacalcet.

Case Report: A 68-year-old African American female with ESRD had a kidney transplant in 2003; however, 2HPT persisted to be clinically significant even after transplant with a normal glomerular filtration rate. The patient was treated with calcimimetics to keep parathyroid hormone (PTH) levels between 200-300. Despite having her PTH levels in the target range, the patient developed calciphylaxis in her right leg. She was managed on cinacalcet, sodium thiosulfate, and wound care. Patient eventually was considered for subtotal parathyroidectomy. The patient's wounds healed quickly after the subtotal parathyroidectomy.

Conclusion: Calciphylaxis, a life-threatening complication of 2HPT, is rarely seen after kidney transplantation. This case highlights that although cinacalcet lowers the PTH, it does not alter the pathophysiology of 2HPT and hence fails to prevent calciphylaxis. Parathyroidectomy, on the other hand, allows calcium and phosphorous to deposit in the bones and hence is a better option in advanced cases of 2HPT and calciphylaxis. In advanced cases of 2HPT, surgical intervention is a better option to prevent and treat calciphylaxis, especially when 2HPT persists after kidney transplantation.



123 A Disease of the Mind From Within

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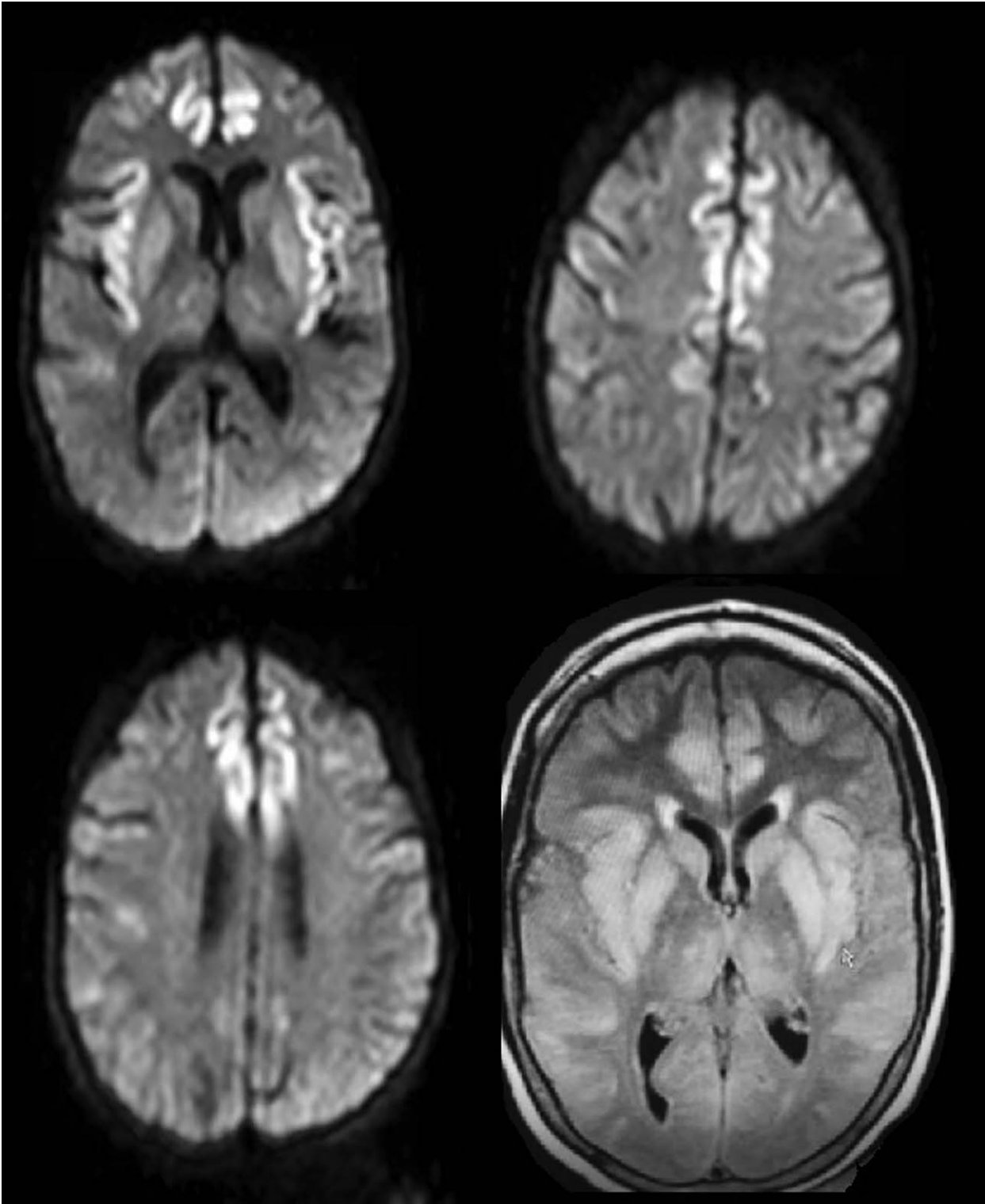
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Background: Creutzfeldt-Jakob disease (CJD) is a disease process characterized by rapidly progressive neurological deterioration with a worldwide incidence of about 1 case per million persons. This infrequency, as well as the symptomatic overlap with other causes of encephalopathy, makes its diagnosis an imposing challenge.

Case Report: A 54-year-old woman with hepatitis C and alcoholic cirrhosis was admitted to the intensive care unit with nausea and vomiting that quickly progressed to postural instability. She was intubated for airway protection following a large episode of hematemesis. After the patient was weaned off sedation, the still-unresponsive patient exhibited intermittent jerking consistent with myoclonus. An electroencephalogram (EEG) showed low-voltage generalized slowing without epileptic activity. At this time, the patient's symptoms were attributed to an ammonia level of 371 mcg/dL. She was started on lactulose but remained encephalopathic despite normalization of ammonia levels. Magnetic resonance imaging (MRI) displayed symmetric diffusion restriction involving the cerebral cortices and the caudate and putamen regions of the basal ganglia, concerning for CJD. Repeat EEG disclosed periodic sharp activity spikes, consistent with a diagnosis of CJD. Lumbar puncture (LP) revealed an elevated protein 14-3-3 at 17 ng/mL. Given the patient's rapid clinical deterioration, EEG, MRI, LP, and exclusion of other etiologies, a preliminary diagnosis of CJD was made and palliative care was consulted for hospice services.

Conclusion: This case illustrates the pace and severity of neurologic decline seen in cases of CJD, as well as the importance of imaging and testing when such a case is suspected. Although definite diagnosis is dependent on neuropathology, an elevated 14-3-3 has 92% sensitivity and 80% specificity, and positive MRI findings demonstrate 96% sensitivity and 93% specificity for a CJD diagnosis.



124 Recurrent Pneumothoraces in a Patient With Pulmonary Benign Metastasizing Leiomyomata

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Background: Pulmonary benign metastasizing leiomyoma (BML) is a rare disease characterized by diffuse bilateral pulmonary nodules derived from smooth muscle. It is a manifestation of leiomyomata with malignant-like character and spread to distant sites from the uterus. Only 120 cases of BML were reported between 1939, when it was first described, and 2013. It occurs in premenopausal women with a history of uterine leiomyomata and is usually diagnosed incidentally. Most cases are asymptomatic, but patients can occasionally experience coughing, hemoptysis, dyspnea, and decreased pulmonary function. Only 1% of cases have been associated with pneumothorax.

Case Report: This study explores the case of a 42-year-old female with recurrent pneumothoraces proposed to be caused by BML. Chest computed tomography (CT) revealed diffuse bilateral pulmonary nodules incidentally after the patient's first pneumothorax 2 years prior. A biopsy was obtained, showing benign smooth muscle that stained positive for desmin and vimentin with blush staining with CD99, BCL-2, and actin. The morphologic and immunohistochemical features of the nodules, along with the patient's history of multiple primary uterine leiomyomata, contributed to the diagnosis of BML. Repeated CT scans had shown no significant changes in the size or number of nodules during the course of 2 years. The patient then suffered 3 additional pneumothoraces, proposed to be a complication of pulmonary BML.

Conclusion: Pulmonologists and oncologists should be aware of BML when determining differentials for multiple pulmonary nodules in women with a history of uterine leiomyomata. Presentation with spontaneous pneumothorax is exceptionally rare. Combining this unique presentation with the overall clinical picture will allow physicians to assess and treat this unusual complication. A standardized treatment regime has yet to be established and requires an individualized approach to therapy for each patient.

125 Osteochondral Allograft for Corticosteroid-Induced Osteonecrosis of the Femoral Head

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Background: Osteonecrosis of the femoral head is a well-known entity resulting from multiple etiologies. Nontraumatic causes include corticosteroid use, systemic lupus erythematosus, Legg-Calvé Perthes disease, caisson disease, and slipped capital femoral epiphysis. Osteonecrosis can be managed nonoperatively via rest, various medications, and physical therapy. Osteochondral allograft has been shown to be an effective procedure for defects in the knee and ankle, with reported 10-year survival rates between 75%-85%. Initial studies demonstrated promising results regarding osteochondral allograft of osteonecrotic femoral heads but cautioned against its use for osteonecrosis secondary to corticosteroid use because of reported failure rates of 50%.

Case Report: This case documents a 22-year-old female undergoing osteochondral allograft for osteonecrosis of the femoral head secondary to chronic corticosteroid use for the management of acute myeloblastic leukemia. Prior to surgery, the patient was in significant pain, averaging 4/10, had restricted range of motion, and reported a Harris Hip Score of 40.66. After the operation, at 6-month follow-up, the patient had full strength, reduced pain, and a Harris Hip Score of 95.6. At 1-year follow-up, the patient reported significant improvement of intrinsic hip joint pain; however, she was limited by trochanteric bursitis with a 60.44 Harris Hip Score.

Conclusion: The evolution of the osteochondral allograft procedure for the femoral head has paralleled the previous adaptations observed from osteochondral allografts of the knee. Establishing accurate patient characteristics predisposing to positive operational outcomes could be of paramount importance to the treatment of avascular necrosis in the young patient. This case report is limited by a short duration of follow-up, along with a postoperative course complicated by trochanteric bursitis. The preliminary results of this case indicate that osteochondral allograft may be a viable operation, even in a cohort of patients that previously had poor outcomes.

126 Osteochondral Allograft Transplantation for Femoral Trochlear Dysplasia

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Background: Femoral trochlear dysplasia is characterized by an abnormally shaped hypoplastic/shallow trochlear groove that can lead to instability of the patellofemoral joint with recurrent patella dislocations, chondromalacia/osteoarthritis, and chronic pain. In many cases, this condition interferes with activities of daily living and participation in sports. The literature offers little in the way of strategies and operative techniques for treatment of this problem in children and in adults.

Case Report: We present a case of a 27-year-old female with recurrent patella dislocations who underwent an osteochondral allograft transplantation of the trochlear groove to treat dysplasia and chondromalacia, an anterior tibial tubercleplasty (ATT) to off-load the transplant, and a medial patellofemoral ligament (MPFL) reconstruction to stabilize the patella. Surgical goals were to re-create a trochlear groove, restore bony restraint to the patella, realign, and off-load the patella. First, an ATT was performed, and the patella was everted 360° with a subvastus approach to access the knee joint. Next, a fresh osteochondral allograft trochlea was sized, and a 35-mm-diameter graft was transplanted, re-creating the groove. Next, the MPFL was anatomically reconstructed using a gracilis allograft. Finally, the tubercleplasty was secured in the anterior position using screws. The patient was braced for 6 weeks following surgery and went through a rehabilitation protocol. At the most recent follow-up, the patient made significant gains in range of motion (0°-120°) and activity compared to her preoperative status. She has minimal pain and no recurrent patella dislocation.

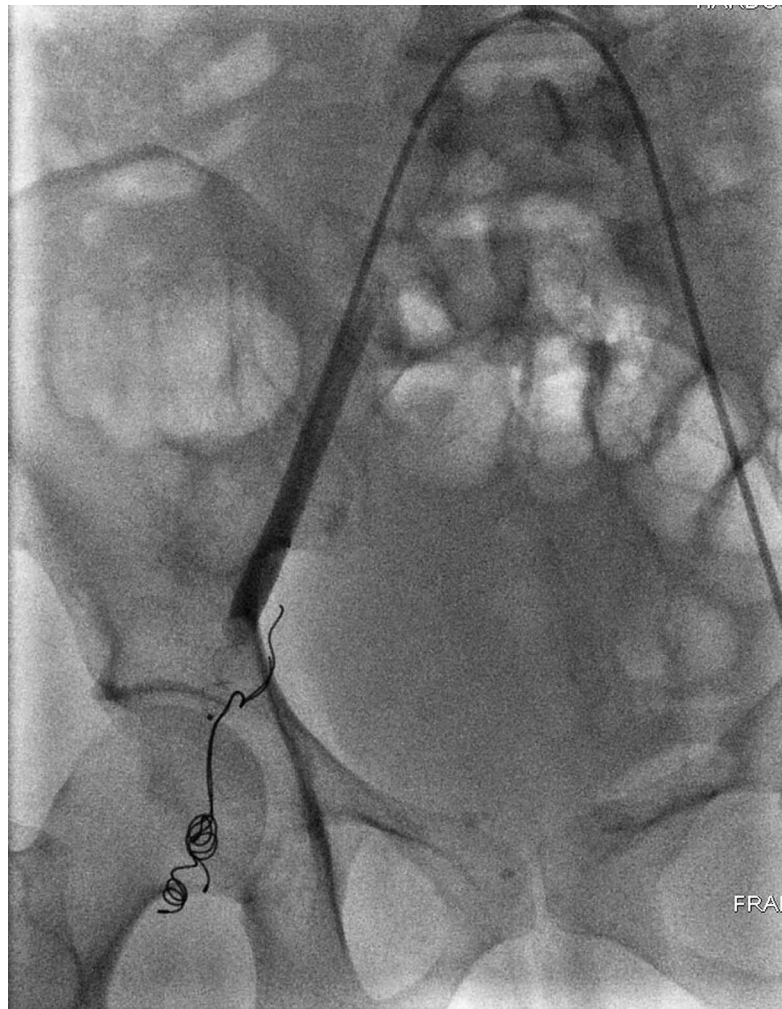
Conclusion: This case demonstrates the use of a surgical option for treatment of trochlear dysplasia, patellofemoral chondromalacia, and instability for those who have failed conservative treatment. This technique allows the patient to have a stable, pain-free knee joint and participate in more activities compared to preoperatively. No clear guidelines and techniques exist for treatment of this condition. The long-term outcome of this procedure is unknown; further evaluation is needed.

127 External Iliac Artery Embolization for Right Hip Disarticulation for Soft Tissue Sarcoma of Right ThighAva Star, MD¹, Dennis Kay, MD^{1,2}¹Department of Radiology, Ochsner Clinic Foundation, New Orleans, LA²The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: A 35-year-old female with a right thigh sarcoma and recent disease progression/increased pain elected to proceed with right hip disarticulation.

Case Report: Magnetic resonance imaging confirmed a large right thigh sarcoma measuring 11.6 × 14.5 × 35.2 cm and involving the entire anterior compartment of the right thigh, splaying the right circumflex arteries, and displacing medially the right deep and superficial femoral arteries. Interventional Radiology was consulted for preoperative embolization of the right external iliac artery to reduce intraoperative blood loss and mitigate postoperative hemorrhagic complications. Using a 6F crossover sheath introduced via lateral circumflex femoral artery, a pigtail catheter was introduced into the distal aorta, and pelvic arteriography revealed hypertrophy of right external iliac artery, with splaying of right circumflex arteries around large mass, with medial displacement of the superficial and deep right femoral arteries. A C2 catheter was advanced into distal right external iliac artery and two 6-mm-diameter Nester coils were deployed in an attempt to coil embolize the right external iliac artery. However, both coils entered the inferior epigastric artery proximally and prolapsed into the deep femoral artery distally. Consequently, the crossover sheath was advanced to the distal right external iliac artery and a 10-mm Amplatzer vascular plug was deployed in the right external iliac artery, with postembolization angiography revealing complete occlusion of right external iliac artery. The patient was sent immediately to OR for right hip disarticulation, which proceeded uneventfully (EBL 200mL). Postoperative course was uneventful.

Conclusion: The patient is doing well. She is participating in physical therapy/rehabilitation and being fitted for a prosthetic, with no evidence of recurrent disease.



128 DEB-TACE of Extrahepatic Collateral Arterial Supply of Hepatocellular CarcinomaAva Star, MD¹, Paul Gulotta, MD¹, Daniel DeVun, MD¹, Dennis Kay, MD^{1,2}, David Kirsch, MD^{1,2}¹Department of Radiology, Ochsner Clinic Foundation, New Orleans, LA²The University of Queensland School of Medicine, Ochsner Clinical School, New Orleans, LA

Background: Extrahepatic arterial supply of hepatocellular carcinoma (HCC) is a known factor mitigating complete tumor response to locoregional intraarterial catheter-directed therapy. Current literature suggests conventional chemoembolization of the extrahepatic arterial supply of HCC is relatively safe and effective, with a low complication rate in appropriately selected cases. Less well studied is DEB-TACE (drug-eluting bead transcatheter arterial chemoembolization) of extrahepatic arterial supply of HCC. We review 4 cases of extrahepatic arterial supply of HCC treated with DEB-TACE.

Case Reports: We reviewed all DEB-TACE performed at our institution for HCC during a 6-month period (Table). Criteria for complications were imaging/chart history of postprocedural complications previously published as associated with conventional TACE. Response was determined by postprocedural imaging >1 month post DEB-TACE. All patients had cirrhosis secondary to alcohol (EtOH), hepatitis C, or primary biliary cirrhosis, and at least 1 HCC. All but 1 patient had undergone at least 1 prior DEB-TACE, all with residual tumor. All patients had total bilirubin <2.1 on the day of DEB-TACE. All were embolized to stagnant flow. There were no intraprocedural complications and all were discharged home same day.

Conclusion: Preliminary findings from our review of 6 months of DEB-TACE performed at our institution for HCC supplied by extrahepatic collaterals suggest that DEB-TACE may be safe, effective, and well-tolerated in this patient population. Recent studies support the efficacy of DEB-TACE compared with conventional TACE in the treatment of HCC. More research is needed on the potential efficacy and safety of DEB-TACE for extrahepatic collateral arterial supply of HCC in cirrhotic patients as a bridge to transplant.

Table. DEB-TACE of Extrahepatic Arterial Supply of Hepatocellular Carcinoma (HCC)

Extrahepatic Arterial Supply Embolized	HCC Location	HCC Size	Dose of DEB	Response	Complications
Right phrenic artery	Segment 7	3.6 cm	33% of 1 vial 100-300 micron LC-Beads containing 75 mg doxorubicin	No residual tumor	None
Right phrenic artery	Segment 7 (3 lesions)	2.0 cm 1.2 cm 1.9 cm	50% of 1 vial 100-300 micron LC-Beads containing 75 mg doxorubicin	Transplanted within 2 weeks of embolization	None
Right phrenic artery	Segment 7	2.7 cm	15% of 1 vial 100-300 micron LC-Beads containing 75 mg doxorubicin	Approximately 50% residual tumor	None
Gastroepiploic artery	Segment 6	1.7 cm	90% of 1 vial 100-300 micron LC-Beads containing 50 mg doxorubicin	Pending	None

129 Y-90 Converted to DEB-TACE of Extrahepatic Arterial Collateral From Gastroduodenal Artery to Segment 6 Hepatocellular Carcinoma (HCC) Due to HCC Tumor Vascularity Supplying Colon

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Background: We present an unusual case of hepatic segment 6 hepatocellular carcinoma (HCC) neovascularity providing arterial supply to the hepatic flexure of the colon and describe successful DEB-TACE (drug-eluting bead transcatheter arterial chemoembolization) embolization of extrahepatic collateral arterial supply to this lesion via a branch of gastroduodenal artery (GDA) without postprocedural complications.

Case Report: A 56-year-old female with hepatitis C/Laennec cirrhosis initially underwent selective DEB-TACE of the right hepatic artery (RHA) for a 2.6-cm segment 5 HCC. Three months post DEB-TACE, imaging revealed interval enlargement of the segment 5 HCC and multiple new lesions. Repeat selective DEB-TACE of the RHA was performed 1 month later, and subsequent selective DEB-TACE of the left hepatic artery was done 2 months after that, during which multifocal new tumor blush was noted in the left hepatic lobe. Subsequent computed tomography revealed extensive progression of disease with innumerable lesions in both hepatic lobes. The multidisciplinary liver conference recommendation was for right Yttrium (Y)-90 radioembolization followed by left Y-90 radioembolization because of the extensive tumor burden. However, at Y-90 planning, celiac angiography revealed extrahepatic arterial supply to a large segment 6 HCC via a branch of the GDA, with tumor vascularity extending inferiorly to supply the hepatic flexure of the colon. At this point, Y-90 planning was converted to DEB-TACE. Using a microcatheter via C2 base catheter, the GDA branch supplying the segment 6 HCC was embolized to near stasis with 25% of one vial of 100-300 micron LC-Beads containing 50 mg doxorubicin. The patient tolerated the procedure well, and her hospital course was uneventful.

Conclusion: This case suggests that DEB-TACE of extrahepatic arterial supply to HCC, even when tumor neovascularity supplies extrahepatic organs, may be safe and well tolerated in cases when radioembolization is not a viable locoregional intraarterial transcatheter-directed therapeutic option for HCC because of the risk of nontarget embolization.



130 A New Arthritis Is Abuzz

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Background: We present the case of a returning traveler from an area where chikungunya virus is endemic. Chikungunya was initially endemic to Africa but has spread rapidly since 2004, and since 2013 has spread widely throughout the Americas.

Case Report: A 42-year-old female with a medical history of hypertension and asthma presented to the rheumatology clinic with 2 months of diffuse arthralgia involving her hands, wrists, and feet, with myalgia. She had had some joint swelling in her hands and feet early on. She also reported fever for a few days early on, but no urinary tract infection or gastrointestinal or other urinary symptoms. She never had had a rash but did have pruritus. She used ibuprofen and naproxen that provided some relief. She had no family history of rheumatic disease, was monogamous with her husband, and had no sick contacts. She had traveled to Honduras just prior to developing symptoms. At physical examination, she had no active synovitis. She was seen before coming to us by her primary care provider and laboratory tests included complete blood count (CBC), comprehensive metabolic panel (CMP), creatine kinase, urinalysis, chest x-ray, negative antinuclear antibody, rheumatoid factor, cyclic citrullinated peptide, blood cultures, influenza antibody, and erythrocyte sedimentation rate of 27. Our workup included normal repeat CBC, CMP, negative human immunodeficiency virus, hepatitis B, hepatitis C, and parvovirus B19. Arthritis survey showed only mild degenerative joint disease in the C spine but no erosions. Chikungunya virus IgM and IgG were positive. We continued treatment with nonsteroidal antiinflammatory drugs, and 1 month later, the patient was asymptomatic.

Conclusion: Chikungunya virus can mimic rheumatoid arthritis and is an important new consideration for patients presenting with polyarthrititis. It should be in the differential diagnosis of any patient with a recent travel history. Treatment is conservative. No disease-modifying antirheumatic drugs or biologic agents have been shown to be effective for treatment of chikungunya-associated arthritis. It is important not to mistake these patients' condition for seronegative rheumatoid arthritis. As of January 12, 2016, no cases in the state of Louisiana had been reported to the Centers for Disease Control for the 2015 calendar year.

131 Pulmonary Endarterectomy for Chronic Thromboembolic Pulmonary Hypertension

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Background: Chronic thromboembolic pulmonary hypertension (CTPH) complicates 4% of cases of symptomatic pulmonary embolism. When pulmonary artery (PA) pressures are >50 mmHg, 5-year survival is 10%.

Case Report: A 35-year-old female was referred for a mass in her left PA. Three months prior, she had been evaluated for shortness of breath and treated for pneumonia. After she failed to progress, the mass was found and presumed to be a pulmonary embolus. The patient continued to have shortness of breath and exercise intolerance. Our preoperative workup included a pulmonary angiogram, with PA pressures measured at 81/33 mmHg. Cardiac magnetic resonance imaging showed right atrial and right ventricular dysfunction, severe tricuspid regurgitation, and an ejection fraction of 47%. She had a negative hypercoagulable workup. A pulmonary embolectomy and bilateral pulmonary endarterectomies were performed via a median sternotomy incision on bypass with deep hypothermia and 55 minutes of circulatory arrest. Afterwards, the right ventricle appeared to have improved function. The PA pressures were in the 40s from 70s prior to incision. The patient did well postoperatively and was discharged on postoperative day 4. She has regained significant functional status. Her 1-month echocardiogram showed a PA pressure of 42 mmHg (68 mmHg preoperatively), a 38% reduction. The tricuspid regurgitation was mild. She was able to return to work. We plan to repeat the echocardiogram at 3 months.

Conclusion: This case illustrates surgical treatment for CTPH. Although there have been successful operations for CTPH for years, the mainstay of treatment for this disease remains medical. There are likely patients with pulmonary hypertension who have correctable disease. It is important to consider surgical intervention because medical treatment is palliative. The resolution of right heart dysfunction and pulmonary hypertension is swift, and the results are permanent.

132 Collateral Urethral Duplication in an Adult With Adult Polycystic Kidney Disease

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Background: Urethral duplication is a rare phenomenon. The accessory or duplicate urethra is typically described based on its meatal orientation in the sagittal plane as dorsal or ventral. Even rarer is duplication in the frontal plane described as coronal, side-by-side, or collateral. When this coronal presentation is present, however, there is typically an associated midline defect or caudal duplication other than in a handful of isolated cases.

Case Report: A 50-year-old black male with stage V chronic renal insufficiency secondary to adult polycystic kidney disease and hypertension was referred for evaluation of gross hematuria and dysuria. He reported that as a child he had 2 separate urinary streams. Physical examination demonstrated an uncircumcised phallus with intact foreskin. There were 2 meatal openings in the coronal plane (Figure). Urinalysis demonstrated proteinuria and microscopic hematuria. Computed tomography and renal ultrasound demonstrated findings consistent with polycystic kidney disease. His renal dysfunction precluded contrast administration, so he underwent bilateral retrograde pyelograms and cystourethroscopy. He was observed voiding and was noted to have a strong stream from the left urethra and no voiding from the right urethra. Retrograde urethrogram simultaneously via both urethra demonstrated an Effman type IIB duplication in the coronal plane. Urethroscopy confirmed a blind-ending right urethra. Cystoscopy and retrograde pyelogram were normal.

Conclusion: We describe a new association with a rare variant of the already rare phenomenon. This case is 1 of <20 cases in the literature describing urethral duplication in the coronal (collateral) plane, the more common variant being sagittal (dorsal-ventral) duplication. This patient is 1 of only 4 cases reported without a concomitant midline anomaly. Furthermore, he is the sole case associated with adult polycystic kidney disease.



133 Reconstruction of the Aortic and Mitral Valves and Aortomitral Curtain in Double-Valve Endocarditis

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Background: Endocarditis presents a treatment challenge for the physician and potential mortality for the patient. When medical therapy fails or complications arise, surgical repair may become necessary. When the endocarditis involves the valve and the aortomitral curtain, the complexity of surgical repair increases dramatically. It is important to appreciate that the 4 cardiac valves do not exist in isolation. The aortic, mitral, and tricuspid valves are all connected at the membranous septum, and this is how a virulent, invasive intracardiac infection can become so destructive. Not only can the primary valve be affected, but infection can also spread into adjacent valves, fistulas can develop into the cardiac chambers or pericardial space, the fibrous skeleton of the heart can be eroded, and the conduction system can be affected.

Case Report: A 34-year-old male was emergently transferred in from another Ochsner facility. He had been diagnosed with endocarditis for more than a year and had been treated with multiple antibiotics. The patient presented with hemoptysis and septic emboli. On transesophageal echocardiogram, the patient appeared to have developed a root abscess with acute aortic insufficiency with mitral regurgitation. The patient was severely volume overloaded, had hyponatremia, was positive for methicillin-resistant *Staphylococcus aureus*, and had a history of intravenous drug and cocaine use. After extensive discussions with the family during which the significant risks of death or poor outcome with the operation were explained, the decision to operate was made. The patient remained hemodynamically stable throughout the procedure, and spontaneous cardiac activity was achieved once the aortic cross-clamp was removed.

Conclusion: The primary objectives of surgery for extensive endocarditis are eradication of all infected and necrotic tissue and reconstruction of the cardiac morphology. The contemporary results of surgery for infective endocarditis indicate that this is still a difficult surgical condition with substantial risk of postoperative morbidity and mortality.

134 Surgical Repair of Kommerell Diverticulum on a Right-Sided Aorta With Aberrant Subclavian Artery

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Background: Kommerell diverticulum can be described as dilation of the aorta at the site of an aberrant subclavian artery. When combined with a right-sided aortic arch, repair of a Kommerell diverticulum presents a rare challenge. This combination of abnormalities occurs in 0.04%-0.4% of the population. It is the result of an error with a remnant of the fourth dorsal aortic arch during development. Treatments for this anomaly range from open surgical repair to total endovascular repair.

Case Report: A 34-year-old female presented with dysphagia lusoria caused by a Kommerell diverticulum with aneurysm on her right-sided aortic arch. The diverticulum measured 2 × 2.5 cm on computed tomography scan. The repair was performed surgically in 2 stages. A left subclavian to carotid transposition was completed before the thoracic approach revascularizing the subclavian distribution. In the second stage, 2 perfusion strategies were available: deep hypothermic circulatory arrest or left heart bypass. Because control of the aortic arch and distal aorta was obtained without difficulty, the patient was placed on left heart bypass for this procedure. The patient remained hemodynamically stable throughout the entire procedure and was taken back to the intensive care unit in stable condition.

Conclusion: The choice of treatment strategy for Kommerell diverticulum is based on the anatomy and comorbidities of the patient and on surgical expertise. The purpose of this case study is to report on the surgical and perfusion strategies used.