

ABSTRACTS

Ochsner's Tenth Annual Research Day May 14, 2013 Ochsner Clinic Foundation New Orleans, LA

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1 Elevated Follicular Helper T Cells in Patients With Rheumatoid Arthritis Correlated to Disease Activity and Autoantibody Production

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Background: In rheumatoid arthritis (RA), autoantibodies can be present in asymptomatic individuals up to 10 years prior to the appearance of the clinical disease. The initiation and development of RA are mediated by humoral response via T cells. Follicular helper T (Tfh) cells are a key component to regulate B cell tolerance and antibody production. To identify the pathogenic role of Tfh cells in RA, we examined the circulating and tissue-infiltrating Tfh-like cells in RA patients and correlated the results with disease activity and autoantibody production.

Methods: Peripheral blood was collected from 22 RA patients and age/gender-matched healthy donors. Synovial fluid specimens from clinically active joints were obtained. Tfh-like cells were defined by their surface molecules (CXCR5, CD57, ICOS, PD-1) and IL-21 production via flow cytometry and immunohistochemical staining. The function of Tfh-like cells was carried out by co-culture of Tfh cells with autologous B cells in vitro. IgG in the culture supernatant was detected by ELISA.

Results The frequency of Tfh-like cells was significantly increased in peripheral blood and synovial fluid of severe RA patients ($P<0.05$). These Tfh-like cells were capable of driving B cells into antibody-producing plasma cells. Furthermore, the circulating Tfh-like cells in RA patients correlated with the percentage of plasmablasts ($r=0.6855$), level of autoantibodies (anti-CCP, $r=0.5587$), and disease activity ($r=0.5587$).

Discussion: Our data suggested that Tfh-like cells have systemic effects on B cell response, as well as local effects on the inflammatory environment in RA patients. Targeting Tfh cells may lead to effective treatment for RA patients and improve the quality of patient life.

2 Engagement of BAFF With Its Receptor and Its Regulation by Prednisone Treatment in Patients With Systemic Lupus Erythematosus

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Background: B cell-activating factor (BAFF) is a critical cytokine supporting B cell survival and development. BAFF overexpression leads to B cell expansion and lupus-like syndrome, whereas BAFF inhibition delays lupus onset in mice. Here, we investigated the regulation role of prednisone on BAFF and BAFF receptor (BAFF-R) in SLE.

Methods: Multicolor flow cytometry (FACS) was performed to analyze cell subsets and their BAFF-R expression in peripheral blood from 38 SLE patients and compared to healthy controls. SLE patients were grouped based on the administration dose of prednisone. Serum BAFF level was qualified by ELISA. The binding capacity of BAFF-R to BAFF was measured by FACS. Tritium-thymidine incorporation was used to measure B cell proliferation in response to recombinant BAFF (rBAFF) in vitro.

Results: BAFF-R expression on B cells was significantly increased in SLE patients ($P<0.005$), while the serum BAFF level increased in 50% of SLE patients. B cells from 100% healthy controls ($n=4$) responded to rBAFF in vitro, while only 17% of SLE patients (1 out of 6) with a low dose of prednisone (<5 mg/d) responded because of prior engagement of BAFF-R with endogenous BAFF. However, B cells from 100% of SLE patients ($n=4$) with high dose of prednisone (>20 mg/d) display a similar response as healthy donors.

Discussion: The elevated BAFF-R on B cells was saturated, binding to endogenous BAFF, which may provide a chronic survival signal to the autoreactive B cells and contribute to the SLE pathogenesis. Prednisone may regulate the interaction of BAFF and BAFF-R in SLE patients, providing new insight into the treatment.

3 The Critical Role of Tumor-Initiating Cells and Lymph Node Stromal Microenvironment in Human Colorectal Cancer Extranodal Metastasis

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Background: Colorectal cancer (CRC) is the third most common cancer and the second most common cause of cancer-related mortality. Outcome depends on multiple factors: staging, lymph node (LN) involvement, local recurrence, and extranodal metastasis. Despite treatment, up to 50% of patients develop extranodal metastasis. We propose that metastasis is associated with CRC-tumor initiating cells (Co-TIC) expressing CD133 and the chemokine CXCR4 and their interaction with the LN microenvironment.

Methods: We established a unique humanized orthotopic xenograft model. The luciferase-tagged CRC cell lines and patient cancer cells were injected intrarectally in NOD/SCID mice. The LN stromal cell lines HK and CXCL12 knockdown HK (HK-KD-A3) were co-inoculated with CRC cells. Tumor growth and extranodal metastasis were followed by luciferase activity using the IVIS Imaging System (PerkinElmer, Waltham, MA) and quantitative PCR for human DNA.

Results: This model mimicked the pattern of CRC spread, showing progressive CRC tumor growth under rectum mucosa with extranodal metastasis in NOD/SCID mice injected with both CRC cell lines and patient cells. The use of HK cells or preincubation of cancer cells with HK cell-conditioned media promoted CRC cell extranodal metastasis. HK-KD-A3 cells showed significantly impaired HK cell support of CRC primary tumor formation and extranodal metastasis. With HK cells, CD133⁺CXCR4⁺ Co-TIC showed increased tumor formation and extranodal metastasis in comparison to unseparated and non-Co-TIC populations.

Discussion: Both Co-TIC and LN stromal factors play crucial roles in CRC metastasis through the CXCL12/CXCR4 axis. Blocking the signaling in Co-TIC/LN stromal interaction may lead to an effective therapy to prevent CRC extranodal metastasis.

4 CD9 on Human B Cells of Germinal Center Origin Contributes to Survival by Strengthening VLA4-Mediated Adhesion to Follicular Dendritic Cells

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Background: Previously, we reported that CD9 is a novel marker for plasma cell lineage-committed cells in human germinal centers (GCs). Here, we investigate the functional role of CD9 on GC-B cells and B lymphoma cells of GC origin.

Methods: GC-B cells were isolated from tonsils and further separated into CD9⁺ and CD9⁻ cells. Apoptosis of the 2 populations in the presence or absence of follicular dendritic cells (FDCs)/HK cells was measured, and their adhesion to tonsillar tissue sections was examined. Similar experiments were performed with B lymphoma cells of GC origin. To elucidate the underlying mechanism of difference in survival and adhesion to tonsillar tissue sections between the 2 populations, the expression of integrin and tetraspanins was compared along with their binding ability to integrin ligands.

Results: CD9⁺ GC-B cells survive better than CD9⁻ GC-B cells in the presence of FDCs/HK cells but not in the absence of FDCs/HK cells, suggesting that CD9 is involved in the interaction with FDCs/HK cells. In addition, CD9⁺ GC-B cells bound to the GC area of tonsillar tissues significantly more than CD9⁻ GC-B cells in the frozen tonsil section binding assay, with no quantitative difference in the expression of integrin and tetraspanins between the 2 populations. CD9⁺ B cells bind to soluble VCAM-1 much greater than CD9⁻ B cells, and soluble VCAM-1 binding leads to an increase in the activated epitope of integrin $\beta 1$.

Discussion: Our data show that CD9 on B cells of GC origin contributes to survival by strengthening adhesion to FDCs through the integrin VLA4-VCAM1 axis.

5 Gamma Secretase Inhibitors Potentiate Vincristine-Induced Apoptosis in a GS Enzyme Activity–Independent Manner

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Background: Gamma secretase (GS) inhibitor (GSI) was developed for the treatment of Alzheimer disease by blocking cleavage of amyloid proteins. We recently found that GSI potentiates the effect of vincristine (VCR), an antimicrotubule agent. Here, we further investigated how GSI enhances VCR-induced apoptosis.

Methods: To investigate the relationship between VCR and GSI, HeLa cells were treated with various doses of VCR and GSI. At different times posttreatment, apoptosis assay and cell cycle analysis were performed. In addition, the potency of GSI as an inhibitor for GS enzyme activity and as a sensitizer for VCR-induced apoptosis was compared. GS activity was measured by quantifying the degree of cleavage of GS substrates (APP and CD44), and the effect of GSI as a sensitizer in VCR-induced apoptosis was measured by quantifying cell viability.

Results: GSI significantly augmented VCR-induced mitotic arrest and subsequent apoptosis in HeLa cells, although GSI alone did not affect cell viability. The GSI potency as a sensitizer for VCR-induced apoptosis was not correlated with the GSI potency as an inhibitor for GS enzyme activity. Furthermore, sequential treatment of these 2 reagents revealed that VCR treatment prior to GSI is required to maximize the combination effect in inducing apoptosis.

Discussion: Our data revealed that GSI enhanced VCR-induced apoptosis independent of GS enzyme activity. Furthermore, the GSI effect was mitotic phase–specific. Hence, GSI may offer therapeutic advantages in treating cancer when used together with VCR through inhibiting not-yet-recognized functions of presenilin in mitosis.

6 Novel Role of Presenilin 1 in Mitosis: Fine Tuning of Microtubule Spindle Formation

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Background: Gamma secretase (GS) complex (subunits: nicastrin, presenilin [PS], APH1, and PEN2) has been the therapeutic target for Alzheimer disease because of its role in the cleavage of amyloid proteins. GS inhibitors (GSIs) were developed for intervening with GS binding to PS. Recently, we found that GSI enhanced vincristine (VCR)-induced apoptosis independent of GS activity. Hence, we investigated the role of PS in mitosis to better understand the synergistic effect of GSI in combination with VCR.

Methods: To examine whether PS protein is localized in the organelles related with mitosis, cells were stained for PS (isoforms: PS1 and PS2), microtubule (α -tubulin), centrosome (Γ -tubulin), and kinetochore (crest). To investigate the functional role of PS1 in mitosis, HeLa cells were treated with DAPT (GSI), VCR, and a combination of DAPT and VCR and then stained for microtubule, centrosome, and activated aurora kinases. The stained cells were examined for aberrant mitotic figures and compared with control untreated cells.

Results: PS1, but not PS2, localized on microtubules during the mitotic phase. In agreement, CLIP-170, a PS1 binding protein, was also localized on microtubule. HeLa cells treated with DAPT and VCR had enhanced aberrancy of mitotic figures compared to VCR alone, while DAPT alone did not have overt phenotypes. Activated aurora A kinase was readily detected in VCR-treated as well as VCR/DAPT-treated cells.

Discussion: DAPT appeared to enhance VCR-triggered aberrant mitotic figures. PS1 might be subtly involved in maintaining normal mitosis, and GSI may interrupt PS1 function by binding to the PS1 protein on the microtubule.

7 Understanding the Microenvironment of Metastatic Renal Cell Carcinoma

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Background: Renal cell carcinoma (RCC), the most common type (~90%) of kidney cancer in adults, is the 8th most common cancer and accounts for more than 13,000 deaths in the United States yearly. Lymph node (LN) involvement is a poor prognostic indicator for RCC. If detected prior to metastasis, RCC is often curable by surgical resection alone. However, there is no curative treatment for metastatic RCC. We sought to understand RCC and its interactions within the LN stromal microenvironment at the cellular level using in vitro and in vivo models.

Methods: Human RCC samples were obtained via nephrectomy or partial nephrectomy of consented study participants. RCC tumor cells and established RCC cell lines were dual-tagged with luciferase and red fluorescent protein (LucRFP). These cells were then injected into NOD/SCID mice with or without LN stromal HK cells or pretreated with FDC-conditioned media. Whole body imaging for luciferase activity from LucRFP-tagged tumor cells was obtained via the IVIS Imaging System (PerkinElmer, Waltham, MA).

Results: Mice injected with RCC-LucRFP cells with FDCs or FDC-conditioned media pretreated cancer cells had significantly greater tumor growth ($P=0.0053$) and correspondent lung metastasis ($P=0.0033$) than those without stromal cell support.

Discussion: LN stromal cells enhance human RCC tumor formation in xenographs. A better understanding of protumor and prometastasis factors provided by LN stromal cells may lead to a novel treatment protocol to prevent and better manage metastatic RCC.

8 CD133⁺ and CXCR4⁺ Colon Cancer Cells as a Marker for Lymph Node Metastasis

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Background: Colorectal cancer (CRC) tumor-initiating cells (Co-TICs) are implicated in both cancer recurrence and extranodal metastasis. CD133 and CXCR4 are specific cell surface markers that are indicators of Co-TICs. The presence of lymph node (LN) metastasis is one of the strongest negative prognostic factors for CRC patients. We examined the relationship between the Co-TIC markers CD133 and CXCR4 and LN involvement in CRC.

Methods: CRC cells were isolated via enzymatic digestion. CD133⁺, CXCR4⁺, and double-positive CRC cells were detected by fluorescence-activated cell sorting (FACS) analysis. The percentage of CD133⁺, CXCR4⁺, and double-positive cells was identified and correlated to the number and percentage of positive LN on staging. The different levels of Co-TIC marker expression were also confirmed by immunohistochemistry (IHC) staining on paraffin slides.

Results: Twenty-seven samples underwent FACS analysis. The mean percentage of CD133⁺ cells was 3.94% (0.15%-19.06%). The mean percentage of CXCR4⁺ cells was 6.15% (0%-27.11%). The mean percentage of CD133⁺CXCR4⁺ cells was 0.45% (0%-2.08%). Thirteen patients had LN metastasis: 8 N1 disease and 5 N2 disease. The correlation coefficients between the percentage of Co-TIC marker-positive cells and the percentage of positive LN were $r=0.58$ ($P=0.0016$) for CD133⁺ cells; $r=0.36$ ($P=0.5868$) for CXCR4⁺ cells; and $r=0.56$ ($P=0.0022$) for double-positive cells.

Discussion: Our results show CD133⁺ and CD133⁺CXCR4⁺ cancer cells correlate with the presence of LN metastasis in CRC. IHC staining of Co-TIC markers may help to develop novel diagnostic and therapeutic options.

9 Stromal Cells Promote the Tumorigenesis and Metastasis in Esophageal Adenocarcinoma

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Background: Esophageal adenocarcinoma (EAC) is an aggressive cancer with a poor prognosis. The incidence of EAC is rapidly increasing; the disease is now one of the leading causes of cancer death. Many therapeutic agents against tumor cells—although showing antitumor activity in cell culture and mouse experiments—have failed in clinic, suggesting that targeting tumor cells alone is not curative for cancers. Recently, the tumor microenvironment has emerged as an essential component for tumorigenesis and metastasis. We investigated the role of stromal cells in EAC growth and metastasis using noninvasive imaging approaches in a human-in-mouse xenograft model.

Methods: The characteristics of EAC patient cancer cells and human EAC cell line OE33 were compared by flow cytometry and immunohistochemistry. Luciferase-tagged OE33 or patient cancer cells were implanted into NOD/SCID mice. EAC tumorigenesis and/or metastasis in the absence or presence of stromal cell HK or HK cell-conditioned media were monitored by a bioluminescence imaging system.

Results: OE33 cells and cancer cells from EAC patients share a similar phenotype. We established a reproducible human-in-mouse xenograft model that developed spontaneous metastasis. The addition of HK cells or HK cell-conditioned media significantly facilitated primary EAC growth and metastasis in the mouse liver and lungs.

Discussion: We have developed a robust approach for the imaging of EAC growth and dissemination, permitting both macroscopic and microscopic analysis of EAC progress. Our data suggested that stromal cells from the tumor microenvironment play a key role in EAC development. This model would serve as a launching pad for evaluating the mechanism of EAC metastasis and testing novel targeted therapies.

10 Biomarkers for Recurrence in Stage II Colon Cancer Patients

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Background: Colorectal cancer (CRC) is the second most common cause of cancer-related mortality in the United States. About 28% of CRC patients present with Stage II disease. The standard treatment for Stage I and II CRC patients is surgical resection without adjuvant chemotherapy. However, despite optimal oncologic treatment, a significant portion of Stage II patients will have locoregional recurrence or distant metastasis to liver or lungs. We sought to identify prognostic protein biomarkers for recurrence in Stage II CRC patients.

Methods: Tissue microarray (TMA) was constructed from archival specimens of 60 Stage II patients matched for age, gender, type of cancer (colon vs rectal), location of tumor, cancer stage, and recurrence or nonrecurrence of cancer during a 5-year period after surgical resection. TMA sections were immunohistochemically stained with CD133, CXCR4, Ki67, CK20, CD26, and IL-6R antibodies. Positive staining was visualized with HRP substrate DAB, followed by HRP-conjugated secondary antibodies. Images were captured with a deconvoluting microscope, and imaging software was used to quantify differences in the expression of protein biomarkers.

Results: We were able to quantify and identify differentially expressed protein biomarkers between recurred and nonrecurred Stage II colon cancer patient groups.

Discussion: Identification of biomarkers that predict Stage II colon cancer patients at high risk for local or distant cancer recurrence may help guide targeted curative therapy.

11 In Vitro Synergy of Polymyxin B and Fluconazole Against *Candida glabrata*

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Background: Polymyxin B, a last-resort antibiotic used to treat multidrug-resistant Gram-negative bacterial infections, is also known to possess in vitro fungicidal activity. A previous study showed synergy with a disk diffusion method when polymyxin B was combined with fluconazole against a single strain of *Candida glabrata*. Because antifungal-resistant *C glabrata* is problematic, we chose to perform synergy testing using this combination against our recent *C glabrata* bloodstream infection isolates.

Methods: Thirty-seven *C glabrata* bloodstream infection isolates were collected between 2009 and 2011 from individual patients. Isolates were identified using the API 20C yeast identification system. Etest MICs were determined in triplicate (mean value used) following the manufacturer's guidelines. Testing was performed in triplicate (mean value calculated) using a modified bacterial Etest MIC:MIC synergy method using concentrations of ½ MIC polymyxin B + 1 MIC fluconazole. Results were read at 24 and 48 h. To evaluate the effect of the combination, the fractional inhibitory concentration (FIC) was calculated for each antibiotic. Synergy was defined by a \sum FIC ≤ 0.5 ; indifference, $>0.5-4$; antagonism, >4 .

Results: Etest MICs ($\mu\text{g/mL}$) were fluconazole, 12 to >256 (68% S-dose dependent; 32% R), and polymyxin B, 64 to $\geq 1,024$. Etest synergy testing showed 26/37 (70%) synergy, including 9/12 (75%) in the fluconazole-resistant strains. Overall, 11/37 (30%) were indifferent. No antagonism was detected.

Discussion: In vitro synergy with polymyxin B and fluconazole was demonstrated in *C glabrata*. Further synergy studies with additional *C glabrata* isolates are needed because polymyxin B + fluconazole may be given to seriously ill patients suspected of having polymicrobial infections.

12 Genotyping by Repetitive Sequence-Based PCR of *Candida glabrata* and the Evaluation of Emerging Resistance

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Background: Increasing *Candida glabrata* bloodstream infections (BSIs) and emerging resistance are problematic, with geographical differences. Therefore, we evaluated the relatedness of our *C glabrata* strains and assessed resistance to fluconazole (FLC), voriconazole (VRC), and caspofungin (CAS).

Methods: Fifty-two *C glabrata* BSI isolates from individual patients were collected during 2009-2011. All were identified using the API 20C yeast identification system, and 48/52 were genotyped using rep-PCR (4 were nonviable). Etest MICs were determined following the manufacturer's guidelines, and the interpretation of MICs for *C glabrata* used recently revised CLSI breakpoints. Each MIC was read independently at 24 h and 48 h by all authors. MIC values between different readers showed 100% essential agreement (≤ 2 -fold dilutions).

Results: Four genetically similar groups were identified: A (n=30), B (n=5), C (n=10), and D (n=3). FLC resistance increased from 7.2% in 2009 to 32% in 2011, but only 1 isolate was resistant to CAS (in 2011). The reading of Etest MICs at 24 hours identified 7/11 isolates resistant to FLC. Genotyping showed that group A represented 8/30 (27%) FLC-resistant as well as the CAS-resistant isolates.

Discussion: This single-center study demonstrated an increase in the antifungal resistance of *C glabrata* BSI isolates from 2009-2011. Genotyping revealed 1 dominant group with a propensity for resistance. This study showed that at 48 hours the Etest was a rapid and consistent method for determining MICs of *C glabrata*.

13 Vancomycin-Resistant *Enterococcus* Colonization in Liver Transplant Patients: A Pilot Study

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Background: Vancomycin-resistant *Enterococcus* (VRE) emerged as an important cause of nosocomial infections in the 1990s and remains a major cause of healthcare-acquired infections, especially in the liver transplant population. Liver transplant patients are at an increased risk of being colonized with VRE because of prolonged hospitalizations, organ dysfunction, use of invasive devices, broad-spectrum antimicrobial use, and immunosuppression. VRE colonization in liver transplant candidates and transplant recipients leads to a 3-fold risk of developing a VRE infection. In addition, studies have shown that post-liver transplantation patients who developed a VRE infection had an increased risk of death compared to those who did not develop an infection (OR 2.65; CI 1.53-4.58). The objective of this study was to identify the rate of VRE colonization in this high-risk population.

Methods: Liver transplant patients were identified during weekly liver transplant clinics. Consent was obtained and a stool sample was collected from each patient. The stool samples were examined via the Spectra VRE CHROMagar (Remel, Lenexa, KS) and chromID VRE (bioMérieux, Durham, NC). The plates were read at 24 hours. Colonies were identified according to the package insert based on morphology and color reaction. If no colonies were seen, the plates were negative. Colonies from positive plates were transferred to an isolation plate and frozen at -70°C .

Results: Twenty patients gave consent, and 15 stool samples were collected; the remaining 5 were never returned. The majority of the patients were male (61%). Of the cohort, 72% had hepatitis C, 22.5% had alcoholic cirrhosis, and 5.5% had other disease. Three patients (20%) tested positive for VRE. All samples have been frozen and stored.

Discussion: This pilot study revealed that the VRE colonization rate in our transplant population is 20%, although the numbers are small. Our goal is to follow all liver transplant candidates who are currently listed, beginning prior to transplant, through transplantation, and follow-up thereafter. We plan to perform targeted antimicrobial prophylaxis with linezolid against VRE with the goal of a positive impact on morbidity and mortality.

14 Salt Excess-Induced Exacerbated Hypertension Prevention by Telmisartan in Spontaneously Hypertensive Rats

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Background: The effects of an angiotensin receptor blocker (AGA), a diuretic, a calcium antagonist (CA), and their combination were evaluated on the progression of cardiovascular damage in spontaneously hypertensive rats (SHRs) given an excess of salt.

Methods: To this end, 8-week male SHRs were divided into 7 groups. The control group (C) received a regular NaCl (0.6%) diet. All other groups received 8% NaCl rat chow. In addition, Group 2 (HS) received a placebo, Group 3 (T) received the AGA telmisartan (10 mg/kg/d), Group 4 (D) received the diuretic chlorothiazide (80 mg/kg/d), Group 5 (T+D) received telmisartan plus diuretic, Group 6 (A) received the CA amlodipine (10 mg/kg/d), and Group 7 (T+A) received telmisartan plus amlodipine. All treatment lasted 8 weeks.

Results: Compared with controls, mean arterial pressure (MAP), renal blood flow, coronary flow reserve, minimal coronary vascular resistance, diastolic time constant, and maximal rate of ventricular pressure fall were all adversely affected by this salt loading. Increased left ventricular weight with marked cardiac fibrosis was also found with salt overload. Telmisartan normalized all indices except MAP, whereas diuretic and amlodipine only partially restored cardiac function and mass. Combination therapy with telmisartan and either a diuretic or amlodipine also normalized all indices, including arterial pressure.

Discussion: These data show that (1) cardiovascular and renal damage induced by salt excess in SHRs was not pressure dependent, and (2) compared with CA and a diuretic, AGA was more effective in this model. These results suggest that local renin in target organs participated in salt-induced hypertension.

15 Consolidated Academic and Research Exposition: A Pilot Study of an Innovative Education Method to Increase Residents' Research Involvement

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Background: Internal medicine residents at the Ochsner Clinic Foundation remain engaged with clinical work and have difficulty initiating and completing research and publishing their scholarly activities. Based on commonly cited barriers, the residency directors at Ochsner initiated the Consolidated Academic and Research Exposition (CARE) program to teach basic research skills and encourage residents' interest and productivity in research.

Methods: The CARE program includes 4 core components: house staff mentoring and the Resident Career Development Program, a journal club, medical writing instruction, and research engagement.

Results: In 2010-2011, 6 residents submitted abstracts to the Louisiana Chapter of the American College of Physicians Associates meeting; 2 abstracts were accepted for presentation. In 2011-2012, 14 abstracts were submitted, 4 of which were accepted for presentation. In 2010-2011, there were 4 submissions to the Southern Hospitalist Conference, which increased to 7 submissions in 2011-2012. The second best presentation award at the Southern Hospitalist Conference was also earned by a resident of this institution. The program saw a 110% total increase in scholarly activity from 2010-2011 to 2011-2012.

Discussion: The CARE program has been in existence for approximately 1 year. Preliminary results were tabulated based on research proposals, posters, abstracts, case reports, and presentations submitted and/or accepted at leading medical conferences over the past year as compared to the same period 1 year ago. Residents, based on survey responses, were more satisfied with the opportunities provided to them to participate in research or scholarly activities. Ochsner's CARE program has appreciably enhanced internal medicine residents' interest in research-related activity, resulting in a substantial increase in resident-authored research papers, abstracts, posters, and case reports being accepted at leading national medical conferences.

16 Long-Term Effects of the Diabetes Boot Camp on Measures of Diabetic Care

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Background: Diabetic patients should receive self-management education to improve self-care and quality of life, but they are frequently unable to attend such programs because of the required time commitment. We instituted an intensive 2-hour Diabetes Boot Camp to provide this education in a condensed timeframe. We determined the long-term effect of the Diabetes Boot Camp on mean hemoglobin A1c (HbA1c) levels in diabetic patients, compared to diabetic patients receiving the standard of care.

Methods: The Diabetes Boot Camp population included all diabetic patients referred to the boot camp from the 10 highest utilizing physicians between July 2009 and July 2010. A control population was randomly selected from these physicians' diabetic patients during the same period. Baseline and postintervention HbA1c measurements of both groups were extracted from electronic medical records. Subpopulations studied included those with HbA1c $\geq 9\%$ and $< 9\%$ at baseline. To evaluate long-term effects, we compared HbA1c levels 2-3.5 years later (July through December 2012) for all groups.

Results: Analyzing the comparison over time, the overall boot camp group (n=69) showed a mean decrease in HbA1c from 8.57% (SD \pm 2.32) to 7.76% (SD \pm 1.85) versus an increase from 7.92% (SD \pm 1.58) to 8.22% (SD \pm 1.82) in the control group (n=107) ($P < 0.001$). Mean length of follow-up was 3.2 (SD \pm 0.54) years.

Discussion: An intensive 2-hour multidisciplinary diabetes clinic was associated with significant long-term improvements in glycemic control in clinic participants.

17 The Nadirs of Blood Glucose Upon Patient Presentation

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Background: A reanalysis of the NICE SUGAR trial associated hypoglycemia in the absence of insulin therapy with higher risk of death in the ICU. We sought to correlate insulin therapy, diabetes mellitus (DM) type, and patient factors with the incidence of severe hypoglycemia (SHG) upon or within 48 hours of hospital admission.

Methods: This single-center, retrospective cohort study analyzed 650,525 blood glucose (BG) values over 27 months for SHG (BG <40 mg/dL). Recorded characteristics of adult subjects suffering SHG included the route of insulin administration, type of DM, hemoglobin A1c (HbA1c) levels, renal function (GFR), care location, and time from presentation to first SHG episode.

Results: Of 274 subjects with SHG, 130 (47.4%) incurred it within 48 hours of admission: 98 (75.4%) within 24 hours, 21 (16.2%) within 24-35 hours, and 5 (3.8%) within 36-47 hours. Eighteen (13.8%) received infusion insulin, and 112 (86.2%) received subcutaneous insulin regimens. Thirty-six (27.7%) had type 1 DM, 89 (68.5%) had type 2, and 5 (3.8%) had gestational or other diabetes. Seventy-two (55.4%) were in noncritical care units, 25 (19.2%) were in step-down units, and 33 (25.4%) were in traditional ICU beds. Fifty-two (40%) had GFR <30 or were on hemodialysis. Available HbA1c of 118 patients followed near-Gaussian distribution. All groups had similar mortality rates.

Discussion: Nearly half of subjects suffering SHG during their hospital stay arrived with or developed it within 48 hours of nonintensive insulin therapy. Most developed SHG in <24 hours, had type 2 DM or impaired GFR, and were not treated with infusion insulin or in a traditional ICU.

18 Reduction in Emergency Department Utilization With Comprehensive Diabetes Care (REDUCE Trial): Baseline Data Analysis

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Background: The use of emergency departments (EDs) has increased dramatically in developed countries, generating high healthcare costs. Repeat users of EDs often have chronic illnesses, such as type 2 diabetes mellitus (T2DM), which are associated with high admission rates. For these patients, improved outpatient care may decrease ED utilization. This study identified patients with T2DM who had not received a hemoglobin A1c (HbA1c) measurement within 1 year and aimed to initiate comprehensive diabetes care with the goal of reducing ED visits.

Methods: Patients were identified from the Ochsner Clinic Foundation primary care diabetes database. The database was queried to find patients in the internal medicine residents' clinic with T2DM who had not had an HbA1c measurement within 1 year (n=113). Baseline analysis included demographics, previous HbA1c values, ED visits, clinic visits, and number of admissions.

Results: Bivariate regression analyses revealed a significant association between clinic and ED visits. With every increase in clinic visits, there was an increase in ED visits by average of 1.5 ($P=0.043$). Additionally, for every increase in clinic visits, there was a decrease in HbA1c levels by an average of 1.28 ($P=0.037$). There were a total of 57 ED visits, or 0.5 ED visits per patient. There was no significant correlation between increasing HbA1c value and ED visits ($P=0.613$).

Discussion: Within a population of patients with T2DM not receiving comprehensive diabetes care, there is a significant association between increasing clinic visits and ED visits, as well as a correlation between increasing clinic visits and decreased HbA1c.

19 Baseline T-Peak to T-End Interval Independently Predicts Both Ventricular Tachyarrhythmia and Death in Patients With Systolic Dysfunction: Extended Follow-up

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Background: The T-wave peak to T-end interval on surface electrocardiogram has been shown to correlate with the total ventricular dispersion of repolarization (DVR). Increased DVR can increase the propensity toward electrical reentry that can cause ventricular tachyarrhythmia. Some evidence shows that among patients with cardiomyopathy, intermediate-term ventricular tachyarrhythmia and overall mortality can be predicted by the heart rate–corrected T-wave peak to T-end interval (Tpe_c). Data with long-term follow-up are lacking.

Methods: Enrollment consisted of 327 patients (75% male, LVEF $23\% \pm 7\%$) with LVEF $\leq 35\%$ and an ICD. Using the automated, previously validated GE Healthcare algorithm 12SL, ECGs were analyzed at baseline. Endpoints were VT/VF, death and a combined endpoint of VT/VF, or death as assessed by prospective device clinic follow-up and Social Security Death Index query.

Results: The average Tpe_c was 108 ± 23 ms. Over a device clinic follow-up of 30 ± 23 months, 93 (28%) patients had VT/VF. Over mortality follow-up of 50 ± 21 months, 99 (30%) patients died. On univariable analysis, Tpe_c predicted VT/VF, death, and the combination of VT/VF or death ($P < 0.01$ for each endpoint). Multivariable analysis—including univariable predictors among demographics, clinical data, medication use, and ECG parameters—showed that Tpe_c remained predictive of VT/VF (HR per 10 ms increase: 1.18, $P < 0.001$), all-cause mortality (HR per 10 ms: 1.14, $P = 0.022$), and the combined endpoint of VT/VF or death (HR per 10 ms: 1.15, $P = 0.001$).

Discussion: With extended follow-up, Tpe_c independently predicts both VT/VF and overall mortality in patients with systolic dysfunction and an implanted ICD.

20 The Correlation Between Body Mass Index and Effective Testosterone Replacement

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Background: Testopel—implantable 75 mg testosterone pellets—has recently become a popular approach to replace testosterone in hypogonadal men. However, limited studies have characterized testosterone levels after pellet implantation. We sought to determine if serum testosterone (T) levels are impacted by the patient's body mass index (BMI) after Testopel implantation.

Methods: We performed a retrospective chart review of male patients undergoing Testopel placement at a single center from 2009 to the present. Specifically, we reviewed patients' age, BMI at the time of Testopel placement, number of pellets placed, baseline T, and changes in total T after replacement. Twenty-six hypogonadal patients underwent Testopel implantation using 10 pellets. The mean age was 56.9 years old, ranging from 28-71. The mean BMI was 30.35 kg/m^2 , ranging from $22.8\text{-}47.3 \text{ kg/m}^2$. Men were divided into 2 groups based on their BMI: those with BMI $< 30 \text{ kg/m}^2$ and those with BMI $> 30 \text{ kg/m}^2$. T was measured at 1 month, and change in T from baseline was compared between the 2 groups using a Student *t* test.

Results: Patients with BMI $< 30 \text{ kg/m}^2$ receiving 10 pellets had an average change in total T of 47.3 ng/dL per pellet at 1 month, while patients with BMI $> 30 \text{ kg/m}^2$ receiving 10 pellets had an average change in T of 35.73 ng/dL per pellet at 1 month ($P = 0.0115$). This result correlated to an average T of 715 ng/dL in patients with BMI $< 30 \text{ kg/m}^2$ and 573.3 ng/dL in patients with BMI $> 30 \text{ kg/m}^2$ ($P \leq 0.0001$).

Discussion: Although this study is limited by a small sample size, men with BMI $> 30 \text{ kg/m}^2$ appear to have less of an increase in total T per pellet than men with BMI $< 30 \text{ kg/m}^2$. Perhaps this information should be taken into consideration when determining the number of pellets to implant. Men with lower baseline total T and a BMI $> 30 \text{ kg/m}^2$ may benefit from more pellets being implanted. Further studies are needed with a larger sample size.

21 Urologic Health in Children With Down Syndrome

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Background: Data have shown that 3% of children with Down syndrome (DS) will have urinary tract anomalies, and screening renal imaging has been recommended. The aims of this study are to characterize lower urinary tract dysfunction (LUTD) in patients with DS, to establish normative data for this patient population, and to compare similar data to a control group (CG).

Methods: We conducted a retrospective review of patients seen with DS and sent a questionnaire to parents of children with a known diagnosis of DS. The survey assessed aspects of toilet training, voiding habits, history of UTIs, and prior urologic evaluation. A control group (CG) of parents of children without DS seen at our institution for nonurologic complaints received the same survey. Statistical analysis used the Fisher exact test.

Results: Data were collected for 77 children with DS compared to 78 children in the CG. The average age of completion of toilet training was 5.5 years in the DS group vs 2.2 years ($P<0.001$). For children <5 years old, 18.8% of the DS group vs 53.6% of the CG were toilet trained ($P=0.03$). For children >5 years old, 79% of the DS group and all children (100%) in the CG were toilet trained ($P<0.001$).

Discussion: Clinical experience demonstrates that children with DS may have associated urologic comorbidities. Our survey indicates that toilet training in children with DS can be markedly delayed by a mean of 3.3 years. Once toilet trained, children with DS are more likely to suffer incontinence. Despite these findings, children with DS are not evaluated for urologic complaints at a significantly greater rate than controls.

22 Influence of Body Mass in Kidney Transplant Patients Receiving Fixed-Dose Alemtuzumab

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Background: Although alemtuzumab is increasingly used for renal transplant induction, uncertainties exist regarding appropriate dosing. Generally, 1-2 fixed doses of alemtuzumab are given perioperatively. However, there may be disadvantages to this one-size-fits-all dosing strategy. We tested the hypothesis that fixed-dose alemtuzumab causes more adverse effects in patients with low body mass. Conversely, patients with high body mass may experience fewer adverse effects, albeit with decreased efficacy.

Methods: This study involved a retrospective review of renal transplant recipients receiving alemtuzumab induction dosed as 30 mg once. Patients were categorized as having low (≤ 60 kg), medium (61-100 kg), or high (>100 kg) mass. Primary outcomes evaluated were rates of neutropenia and opportunistic infections. Secondary outcomes included filgrastim use, rejection, 1-year glomerular filtration rate (GFR), graft loss, and death. Outcomes were assessed for postoperative days 0-365.

Results: A total of 304 renal transplant patients received alemtuzumab (39 low-, 207 medium-, and 58 high-mass patients). Neutropenia occurred more frequently in low-mass (67%) patients, compared to medium- (45%) or high-mass (29%) patients ($P<0.03$ all comparisons). Opportunistic infections occurred more frequently in the low-mass (44%) patients, compared to medium- (17%) or high-mass (12%) patients. Filgrastim was administered more frequently in low-mass (36%) patients, compared to medium- (23%) or high-mass (9%) patients. We found no significant differences in rejection, 1-year GFR, graft loss, or death.

Discussion: Low-mass renal transplant recipients receiving fixed-dose alemtuzumab experienced greater rates of neutropenia and opportunistic infections than medium- or high-mass patients.

23 Complicated Artificial Urinary Sphincters and Outcomes

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Background: We assessed the feasibility of artificial urinary sphincter (AUS) implantation in patients considered complicated. Complicated, high-risk implants were defined as sphincters placed in the setting of preoperative radiation, previous AUS, or previous bladder neck contracture. We compared outcomes in complicated patients to patients considered uncomplicated.

Methods: Charts were reviewed from patients who underwent AUS implantation. We compared the difference in outcomes of complicated AUS cases with uncomplicated cases using paired *t* tests. Failure was defined as pad usage >1 per day, patient-reported failure, reoperation required because of lack of efficacy, or explantation.

Results: Of the 61 patients who underwent AUS implantation, 48 (80%) had appropriate information for inclusion in the study. The complicated group had a failure rate of 7/25 (28%) compared to 4/19 (21%) for the uncomplicated group ($P=0.59$). When analyzing the complicated group, increasing numbers of risk factors compounded the risk of a poor outcome: The failure rate for patients with 1 risk factor was 2/14 (14.3%) vs 4/10 (40%) for 2 risk factors and 1/1 (100%) for 3 risk factors. The presence of stricture failed was 0/4 (0%), of radiation was 2/7 (28%), and of prior explantation was 1/3 (33%). The combination of explantation with stricture or radiation portended a worse outcome than stricture and radiation (100% vs 44%, respectively). Statistically, these results were seen as trends.

Discussion: AUS in complicated patients is feasible. The risk of failure increases if more than one risk factor is present, and rises with additional risk factors. Previous explant of AUS was the most ominous preoperative risk, and isolated strictures may not be a risk factor alone if treated.

24 Primary Treatment for Organ-Confined Prostate Cancer: Does Age or Race Matter?

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Background: Our goal was to determine whether racial and/or age differences exist in the primary treatment for organ-confined prostate cancer detected by prostate biopsy after detection of PSA >4 mg/mL within an equal insurance coverage system provided by the Veterans Healthcare Administration (VHA).

Methods: We identified a cohort of 20,694 African-American and Caucasian veterans ages 40-70 with PSA >4 mg/mL from October 2000 through September 2007. A total of 6,223 veterans underwent prostate biopsy, and 3,030 veterans were diagnosed with prostate cancer. We performed a retrospective chart review and/or obtained data from the VHA Central Cancer Registry on patients with organ-confined disease. We report the pathologic findings and primary treatment type, stratifying by age and race. Treatment categories included active surveillance, surgery (radical prostatectomy), radiation therapy, hormonal therapy, other (photon beam, cryotherapy), and refused/no treatment.

Results: Of the 3,030 veterans with prostate cancer, 551 were excluded (400 because of missing data; 151 because of non-organ-confined disease). We analyzed data for 2,479 veterans with organ-confined prostate cancer. Surgery was the most common primary treatment for both African-American and Caucasian veterans ages 40-49 years (>50% for both races). Among patients ages 50-59 years, African-American veterans were most commonly treated with radiation (48%), while Caucasian veterans were most likely to undergo surgery (52%). Radiation was the most common primary treatment modality for veterans ages 60-70 of either race (60% of African-Americans; 45% of Caucasians).

Discussion: Racial and age-specific differences were observed in the type of primary treatment received for organ-confined prostate cancer in veterans.

25 Validation of the Patient Global Impression of Improvement for Penile Prosthesis

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Background: Currently, no consensus exists regarding the preferred means of evaluating patients after the placement of an inflatable penile prosthesis (IPP). Many questionnaires exist, but none have targeted postoperative IPP patients. We proposed using and validating the Patient Global Impression of Improvement (PGI-I)—a global assessment that has been validated for outcomes in many conditions—to examine patient improvement following IPP placement.

Methods: This IRB-approved prospective trial enrolled patients undergoing IPP. Each patient completed a preoperative Sexual Health Inventory for Men (SHIM) and Erectile Dysfunction Inventory of Treatment Satisfaction (EDITS). Postoperatively, each patient completed a SHIM, EDITS, and PGI-I at 3, 6, and 12 months. Spearman correlation coefficient (SCC) compared change in EDITS and SHIM scores with PGI-I over time.

Results: A total of 39 patients were enrolled. Mean PGI-I improved from 2.23 to 1.42 over 12 months. Mean SHIM and EDITS scores improved from 5.2 to 16.5 and 15 to 36, respectively. At 3 months, PGI-I correlated with EDITS change with SCC of 0.58 ($P=0.049$). PGI-I at 6 months correlated with SHIM with SCC of 0.82 ($P=0.006$). A Spearman aggregate score showed a strong correlation between SHIM and EDITS of 0.72 ($P<0.0001$) as well as SHIM to PGI-I (SCC= 0.58, $P=0.38$) and EDITS to PGI-I (SCC=0.89, $P<0.0001$).

Discussion: Overall PGI-I appears to correlate with SHIM and EDITS. A larger sample size will be needed to confirm this correlation and validate the PGI-I for use after IPP placement. Initial results appear promising.

26 Public Perception of Vaginal Mesh and the Media

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Background: Since the 2011 FDA communication on transvaginal mesh (TVM), there has been a rapid increase in lawsuit advertisements directly marketed to patients in various media. We have encountered patients with heightened concerns citing these advertisements. Through a questionnaire-based study, we hoped to assess the penetration of advertisement awareness in our patient population and to examine whether such exposure affects patient opinion.

Methods: Following IRB approval, we designed a 17-item multiple choice survey and began administering it in August 2012 to female patients in urology and urogynecology clinics at 2 academic institutions. We excluded new patients with pelvic organ prolapse (POP) or stress urinary incontinence (SUI) and patients who reported prior surgery. We continue to accrue patients, with IRB approval pending at 1 more institution.

Results: Seventy-eight patients completed questionnaires. Of these 78 patients, 53 (66.7%) had heard of TVM; of these 53, 33 (62%) cited advertisements as their initial source of information. Regarding opinions of TVM, 1.9% chose “it is a safe product,” 7.5% “safety depends on factors related to patient,” 1.9% “not a safe product,” and 77.4% “I don’t know.” Also, 5.7% patients chose 2 selections, and 3.8% patients chose “safety depends on the doctor.” Of the 53 patients aware of TVM, 9 would consider mesh if they needed surgery for POP, 11 responded “no,” and 30 responded “maybe.” Of the “no” or “maybe” respondents, if a doctor told them they would benefit from mesh, 30.2% would change their minds, 9.4% would not, and 39.6% might. Only 11.3% indicated knowing the difference between the use of TVM for POP versus that for SUI. In addition, 15.1% were aware of the FDA safety communication. When asked what the strongest influence on their opinion of TVM was, responses were advertisement, newspaper, or internet (32.1%); medical professional (26.4%); and “not sure” (28.3%).

Discussion: Advertisements of TVM lawsuits have a high penetration into our patient population. Few patients knew of the FDA communication or the difference in indications for TVM between POP and SUI. Despite these facts, patients indicated that they would still consider TVM, especially with a physician’s advice. We must be aware of the effect of these advertisements on patient opinion and provide effective, unbiased, and scientifically accurate counseling of risks and benefits.

27 Cost Analysis of Topical Tranexamic Acid Use in Reducing Perioperative Blood Loss in Total Knee Arthroplasty

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Background: The use of topical tranexamic acid to decrease perioperative blood loss following total knee arthroplasty (TKA) has increased. The purpose of this study was to evaluate the effectiveness of topical tranexamic acid in primary TKA from a clinical and economic standpoint.

Methods: We retrospectively reviewed 683 primary total knee arthroplasties performed by 3 surgeons at a single institution over a 2-year period. We compared 373 cases performed in 2010 without the application of tranexamic acid to 310 cases performed in 2011 with the application of tranexamic acid. We collected demographic data, preoperative and postoperative hemoglobin, transfusion rates, hospital length of stay, cost, and perioperative complications during the first 3 months. Statistical analysis was performed using 2 sample *t* tests and Fisher exact tests.

Results: We found no differences in age, sex, height, or preoperative hemoglobin between the two groups. Patients treated with tranexamic acid had significantly higher postoperative hemoglobin ($P<0.001$); received significantly fewer transfusions ($P<0.001$); and had decreased length of stay ($P<0.001$), decreased blood bank costs ($P<0.001$), increased pharmacy costs ($P<0.001$), and decreased total direct cost to the hospital ($P<0.001$). The average savings were approximately \$1,500 per patient. We found no differences in thromboembolic events or infection rates.

Discussion: The use of topical tranexamic acid in primary TKA is safe and effective and results in significant cost savings.

28 The Financial Impact of a Multidisciplinary Perioperative Risk Stratification Program for Total Joint Arthroplasty

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Background: Complications following hip and knee arthroplasty often require prolonged hospital admission periods and added hospital resources, ultimately resulting in increased costs per hospital stay. However, if patients are preoperatively risk stratified for specific high-risk medical issues, many complications may be avoided. By using a multidisciplinary perioperative risk stratification program, the cost per hospital stay for hip and knee arthroplasty may decrease.

Methods: We reviewed 2,637 joint arthroplasty cases consisting of primary and revision hip and knee arthroplasties performed at 1 hospital. This group was separated into a nontriage group (N) and a triage group (T). N consisted of 1,139 cases that were performed prior to the formation of a multidisciplinary perioperative risk stratification program for joint arthroplasties at the hospital. T consisted of 1,498 cases that were performed after the formation of the risk stratification program. We compared these 2 groups with regard to complications, length of stay (LOS), and cost per hospital stay.

Results: The preliminary results showed that the difference in complication rate was not statistically significant ($P=0.1864$). However, the difference in the mean length of stay between the 2 groups was statistically significant ($P\leq 0.001$), with the T group showing a significantly lower LOS.

Discussion: We found a statistically significant difference in the mean LOS between the 2 study groups.

29 Significant Reduction in Fluoroscopy Time and Radiation Dosage Utilizing an Innovative Guide Wire for the Placement of Percutaneous MIS Pedicle Screws

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Background: Numerous studies demonstrate increased radiation exposure with minimally invasive spine surgery, which can increase the risk of cataracts and malignancies. Additionally, inadvertent advancement of pedicle screw guide wires through the vertebral body can occur, placing structures ventral to the spine at risk. A new split-tip guide wire has been introduced that can inhibit inadvertent advancement and reduce the fluoroscopic surveillance required. This study compares radiation exposure and complications between MIS spine cases using a standard straight guide wire and a split-tip guide wire.

Methods: We prospectively randomized 20 consecutive patients undergoing MIS TLIF at L5-S1 into 2 groups: Group 1—MIS with standard guide wire and Group 2—MIS with split-tip guide wire. We recorded total fluoroscopy time, radiation dosage, operating room time, and complications.

Results: Total fluoroscopy time for Group 1 averaged 232.1 seconds vs 152.2 seconds for Group 2 ($P=0.017$). Radiation dosage for Group 1 averaged 17.22 rads vs 9.29 rads for Group 2 ($P<0.001$). We found no significant difference in operating room time between the 2 groups ($P=0.18$). Inadvertent advancement of 1 S1 guide wire in Group 1 occurred.

Discussion: Split-tip guide wires for percutaneous pedicle screw placement decreased fluoroscopy time by 34% and radiation dosage by 46%. The design of this split-tip wire may prevent inadvertent advancement, reducing the risk of injury to structures ventral to the spine. The resistance to inadvertent advancement decreases the need for fluoroscopic surveillance and in turn decreases radiation exposure to both patient and surgeon.

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

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Background: Poor bone quality or endplate violation during discectomy can result in interbody cage subsidence and affect stability. The peripheral ring apophysis is the strongest portion of the vertebral body endplate.

Methods: We obtained 40 specimens from 8 fresh-frozen human lumbosacral spines. After DEXA scans and x-rays, each specimen was randomly grouped. Group 1 had an intact endplate with a short cage that did not span the ring apophysis. Group 2 had an intact endplate with a long cage that spanned the ring apophysis. Group 3 had an endplate decortication with a short cage. Group 4 had endplate decortication and a long cage.

Vertebrae were tested in an MTS load cell. Load displacement data were collected at 5 Hz until failure. Failure was defined as cage subsidence >5 mm or endplate fracture with axial displacement of the actuator >5 mm. Load displacement curves were plotted to calculate failure loads and displacement. Loads were normalized with respect to the bone mineral density of the specimens.

Results: Longer cages spanning the ring apophysis with intact endplates had a significant increase in strength and less subsidence compared to the smaller cage group with intact endplates ($P=0.003$). Cages spanning the ring apophysis of intact endplates showed a significant increase in compressive strength and resistance to subsidence compared to cages of similar length in decorticated endplates ($P=0.028$).

Discussion: Lateral lumbar interbody cages spanning the ring apophysis increase the load to failure by 40% with intact endplates and by 30% with decorticated endplates. Cages spanning the ring apophysis could improve compressive strength, decrease subsidence, and mitigate potential causes of subsidence (endplate violation or poor bone quality). This technique could improve fusion rates.

31 Clinical Outcomes in the Arthroscopic Management of Labral Pathology in Femoroacetabular Impingement

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Background: We hypothesized that a comparison of labral debridement to labral repair outcomes in the arthroscopic treatment of femoroacetabular impingement (FAI) would reveal no significant differences.

Methods: We prospectively assessed 200 patients who underwent arthroscopic management of FAI with associated labral pathology from February 2009 to April 2012. Outcomes were measured preoperatively and postoperatively with the modified Harris Hip Score, Short Form-12, Visual Analog Scale for pain, and the International Hip Outcome Tool. Statistical analyses compared outcome differences between labral debridement (Group D) and repair (Group R).

Results: By using a subset of the data available, preliminary results show the debridement group to have a larger percentage of hips with advanced arthritis ($P=0.0089$). All median outcome scores were significantly improved ($P<0.01$) in both groups. Comparative analysis of final median scores revealed no differences between the groups at final follow-up. Age ≤ 30 was the only factor found to be predictive of a good outcome ($P=0.003$).

Discussion: Preliminary results indicate that equivalent short-term outcomes can be expected with either repair or debridement when treating labral pathology in association with FAI.

32 Comparison of Autologous Chondrocyte Implantation Using a Porcine-Derived Type I Collagen Implant to a Periosteal Graft

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Background: Autologous chondrocyte implantation (ACI) has become an accepted technique for addressing well-defined chondral or osteochondral defects in the knee. The technique involves injecting a cellular suspension of autologous cultured chondrocytes under an autologous periosteal patch, which requires harvest typically from the tibial diaphysis. Disadvantages include a significant reoperation rate because of periosteal overgrowth and extensive scarring. However, there are now several periosteal graft replacements available commercially. The goal of this study is to show that ACI performed with a porcine-derived type I collagen implant provides good to excellent results in a majority of patients. The collagen implant also provides a potential decrease in postoperative scarring, leading to a decreased reoperation rate compared to ACI with a periosteal patch.

Methods: We retrospectively evaluated 98 consecutive ACI cases between September 1999 and July 2011. All patients were treated by one surgeon (DJ). Patients were allocated into periosteal patch or porcine allograft groups. At their initial office visit, all patients had a baseline International Knee Documentation Score (IKDC) and Short Form 12 (SF-12) score established. Postoperative data were collected at 1, 2, 3-5, and 7-10 years, with a minimum 1-year follow-up. The follow-up data include reestablishing SF-12 and IKDC scores, allowing an objective determination of clinical outcome at these postoperative timepoints. The follow-up data also include the Knee Injury and Osteoarthritis Outcome Score (KOOS). SF-12 and IKDC scores were compared both before and after surgery and between periosteal patch and porcine allograft groups. KOOS scores were compared between groups postoperatively.

Results: We found a significant difference between preoperative and postoperative scores in both periosteal patch and porcine allograft groups, with a significant increase in both IKDC and SF-12 scores. Comparisons of SF-12, IKDC, and KOOS postoperative scores showed no significant differences.

Discussion: Despite evidence in the literature of periosteal overgrowth and arthrofibrosis, there does not appear to be a difference in outcomes between the periosteal patch and the porcine allograft. Both techniques show improvement in SF-12 and IKDC scores and no differences between the groups. As such, surgeons should decide which technique to use based on the best technique in their hands.

33 Incidence of Lumbar Plexopathy While Utilizing Mechanomyography as an Alternative to Electromyography for Transpsoas Lateral Interbody Fusion

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Background: The incidence of thigh complications during transpsoas lateral interbody fusion (LIF) ranges from 0.7% to 75%. Studies have questioned the reliability of electromyography (EMG) in preventing nerve root palsy. Mechanomyography (MMG) may provide an alternative to EMG. In this study, we evaluated the incidence of thigh complications using MMG during transpsoas LIF.

Methods: A retrospective review of prospectively collected data was completed at 4 institutions. Fifty-one consecutive patients with 108 levels fused using the transpsoas LIF technique (L1-L5) during an 8-month period were included. Immediate postoperative and routine follow-up clinical examinations were performed.

Results: The rate of ipsilateral thigh symptoms (pain, numbness, weakness) was 15.7% (8/51). Four patients (7.8%) had iliopsoas or quadriceps weakness (3/5 motor strength). Four patients (7.8%) had anterior thigh pain and numbness. All patients with postoperative thigh symptoms (8/8) had a 3- or 4-level procedure performed for degenerative scoliosis and included L4/5. All thigh symptoms resolved within 3 months.

Discussion: MMG is the mechanical signal seen from the surface of a muscle when it contracts after stimulation. MMG may be a useful addition to the surgeon's armamentarium. With the use of MMG, the rate of ipsilateral thigh symptoms was 15.7%, which is at the lower end of previously reported rates for the transpsoas procedure. Direct trauma to the psoas may have contributed to some of our results, especially in the multilevel procedures. All patients had L4/5 included in their construct. MMG is a safe alternative to EMG to monitor the lumbar plexus when performing transpsoas LIF.

34 Does Spanning the Ring Apophysis Affect Lateral Lumbar Interbody Fusion Rates: A Preliminary Report

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Background: Interbody fusion using cages has traditionally been performed using anterior (ALIF) or posterior (PLIF, TLIF) techniques. Recently, a technique using cages inserted through a transpsoas approach for lateral interbody fusion (LIF) has been described. This approach can avoid many of the complications seen with other techniques. Because the ring apophysis is the strongest portion of the vertebral body endplate, spanning this structure may increase stability and decrease subsidence. The purpose of this study was to use CT scans, the radiographic gold standard, to assess interbody fusion rates for the LIF technique.

Methods: We performed a retrospective CT scan assessment of 56 patients with 97 levels who underwent LIF with posterior instrumentation between January 2008 and December 2012. Per the study protocol, patients received CT scans at their 1-year follow-up. Of the 56 patients, 28 patients with 51 levels met the inclusion criteria for this preliminary report. Two board-certified musculoskeletal radiologists assessed fusion.

Results: Both radiologists agreed that bony fusion was achieved at all 51 levels (100% fusion rate) assessed by coronal, sagittal, and axial reconstructive thin-cut CT images.

Discussion: Several studies have evaluated LIF fusion and reported fusion rates of 88%-96%. Our results demonstrate high fusion rates using this technique. Because stability plays a vital role in successful fusion, spanning the ring apophysis with the lateral cage and pedicle screw supplementation appear to be key factors. Further data will be reported in the future.

35 Mepivacaine for Spinal Anesthesia in Total Knee Arthroscopy (TKA) Allows for Shorter Postanesthesia Care Unit (PACU) Stay When Compared With Bupivacaine: A Retrospective Study

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Background: The PACU setting holds potential for healthcare cost reduction. Previous studies demonstrate PACU cost savings with spinal anesthesia (SA) compared to general anesthesia (GA). However, limited data exist regarding the cost effectiveness of varying types of local anesthetics for SA. When a shorter-acting local anesthetic (eg, mepivacaine) is used, patients may meet PACU discharge criteria earlier than when a longer-acting agent (eg, bupivacaine) is used. The present study examined PACU length of stay in patients undergoing TKA when using mepivacaine versus bupivacaine for SA.

Methods: The study was a retrospective chart review of patients undergoing primary unilateral TKA between June and October 2012. Patients included in the study received mepivacaine or bupivacaine for SA. PACU length of stay, spinal duration, and initial PACU pain score were recorded.

Results: Eighty-one bupivacaine and 34 mepivacaine patients were included for analysis. Patients were excluded because of incomplete records and the use of GA. Spinal duration was significantly longer in the bupivacaine group (244.2 ± 120.5 minutes) compared to the mepivacaine group (80.2 ± 72.8 minutes). PACU time was longer in the bupivacaine group compared to the mepivacaine group (298.2 ± 110.6 and 242.4 ± 66.2 minutes, respectively). Pain scale upon arrival to PACU was lower with the use of bupivacaine (0.26 ± 1.3) than with mepivacaine (2.3 ± 3.9).

Discussion: This study demonstrates that the use of mepivacaine compared with bupivacaine for SA in TKA results in shorter block duration and shorter PACU time. The application of these results can allow for cost savings by improving PACU throughput.

36 Hot Versus Cold Endoscopic Polypectomies: Is One Safer Than the Other?

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Background: Colonoscopy is a routine procedure performed for diagnostic or therapeutic reasons. The decision to perform a hot or cold biopsy is left to the discretion of the endoscopist with no strong evidence to support one method over the other. The aim of this study was to evaluate the incidence of postpolypectomy complications in patients undergoing either cold or hot endoscopic polypectomy.

Methods: We performed a retrospective analysis of patients who underwent colonoscopy at Ochsner from January through December 2006. The primary outcome measures were the incidence of bleeding, perforation, and postpolypectomy syndrome within 30 days of cold or hot endoscopic polypectomy. Patients on anticoagulation therapy were excluded from our study population. The *t* test was used for statistical analysis, with $P \leq 0.05$ considered significant.

Results: A total of 219 patients underwent endoscopic polypectomy. The median age of the group was 59 years old. We found no difference in the size of polyp between the groups. The polypectomy complications for the 197 patients undergoing hot polypectomy were 5 (2.5%) patients with bleeding, 1 (0.5%) patient with perforation, and 1 (0.5%) patient with postpolypectomy syndrome. One of the 7 underwent surgery secondary to complications. The 22 patients undergoing cold polypectomy had no complications. We found a statistically significant difference in polypectomy complications between cold and hot polypectomy ($P=0.02$).

Discussion: Our study indicates that when possible polyps should be adequately treated with cold polypectomy to avoid the risks of clinically significant postpolypectomy bleeding, perforation, or postpolypectomy syndrome associated with hot polypectomy.

37 Evaluating Smart Pump Technology Utilization in Improving Intravenous Medication Administration Safety

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Background: Improving nursing utilization of smart pump technology to reduce adverse events from intravenous medication administration requires ongoing assessment and communication of actual clinical practice versus reported events. The purpose of this project was to complete a longitudinal assessment of smart pump utilization to identify trends that affect patient safety and financial outcomes.

Methods: Using a plan, do, study, and act methodology, an interdisciplinary team consisting of pharmacists and nursing unit representatives was created to assess 2012 smart pump utilization. Quarterly data analyses to identify trends in specialty-specific drug profiles included drug profile data usage over time, top drug overrides, override causes, good catches, and cost avoidance for potential severe adverse events. Smart pump data were wirelessly transmitted to a national database for analyses.

Results: Smart pump utilization data (2012) trended upward to 80% compared to a national benchmark of 72%. Drug profile utilization improved from 30% to 75% for all 6 profiles except oncology. The top continuous infusion drug overrides included propofol, oxytocin, and heparin. Fourth-quarter analyses found that continuous infusions in critical care exceeded the time limit by 2 times for propofol, 10 times for oxytocin, and 1.5 times for heparin. Overall, the highest percentage of good catches (31% to 52%) involved decimal point errors in rate or dose programming. An estimated \$1.9 million annual cost avoidance from severe harm averted from actual events was calculated using a proprietary formula.

Discussion: Twelve-month findings support a potential benefit of smart pump technology in improving high-risk intravenous medication administration safety.

38 A Critical Analysis of Prophylactic Antiemetic Therapy Influencing Laparoscopic Cholecystectomy Same-Day Discharge

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Background: Advances in surgical and anesthetic management in laparoscopic cholecystectomy have led to the majority of patients being discharged on the day of surgery. However, postoperative nausea and vomiting (PONV) commonly occur, impairing recovery and increasing costs. This study evaluated known risk factors for PONV and current therapeutic regimens.

Methods: Following IRB approval, an observational study of all patients undergoing laparoscopic cholecystectomy at Ochsner Medical Center was conducted in 167 patients over a 6-month period. We used postoperative questionnaires to collect information on clinical endpoints related to risk factors for and adverse events from PONV.

Results: Multivariate analysis revealed that previous history of PONV and duration of NPO are risk factors (AUC=0.78) associated with PONV within 1 hour following surgery. We found no association between duration of surgery or preoperative antiemetic administration and the incidences of nausea, retching, or vomiting within 1 hour following surgery. However, preoperative benzodiazepine administration, but not preoperative opiate administration, did affect the incidence of PONV (LR χ^2 4.9, $P=0.03$). Finally, we found no association between postoperative nausea, retching, or vomiting and PACU length of stay.

Discussion: Our preliminary study supports the findings of others regarding a high incidence of postoperative nausea but a low incidence of vomiting. Interestingly, the use of prophylactic antiemetics did not decrease the incidence of postoperative nausea within 1 hour following surgery, in contrast to other reports.

39 Prediction of Postoperative Hypothermia and Instituting Improvement by Statistical Process Control

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Background: Improving healthcare requires changes in the service delivery process. Despite active perioperative warming protocols, postoperative hypothermia (PH) requiring forced-air rewarming continues to affect 8.5% of postanesthesia care unit patients at Ochsner Medical Center (OMC). The investigation of causative variables associated with PH will allow the development of a predictive model and the institution of corrective strategies that can be monitored by statistical process control (SPC).

Methods: We conducted a cross-sectional, observational analysis of 781 adult surgical patients at OMC during a 4-month period in 2012 to collect demographic, environmental, and procedural variables associated with the need for active rewarming in postoperative patients. Logic regression identified causative variables, which allowed constructions of Pareto plot, Ishikawa diagram, medical decision tools, and SPC charts as aids for healthcare providers to use with at-risk patients.

Results: Multivariate analysis identified the patients' type of anesthesia, age, magnitude of surgery, total intravenous fluids, and BSA as risk factors for the development of PH (AUC=0.85). Pareto plot analysis identified the period immediately following surgery as having the greatest risk for patient temperature change. Baseline SPC chart analysis identified that the majority of admission PACU temperature variances were single-aberration shifts, suggesting a need for global corrective action.

Discussion: PH contributes to increased healthcare costs. Electronic medical record integration with medical decision tools can allow a proactive method for identifying at-risk patients. The immediate postsurgical period is when initial global efforts to correct the development of PH should occur, using SPC charts to monitor changes in service delivery.

40 Converting to High Definition May Improve Operative Stress but Does Not Improve Outcomes

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Background: High-definition laparoscopic equipment increases the clarity and detail of images compared to the standard laparoscopic equipment. This increased definition of anatomy has the potential to optimize laparoscopic procedures and improve outcomes and operating room times. We investigated whether operating room times and outcomes were improved with high-definition laparoscopic equipment.

Methods: From a prospectively gathered database, we retrospectively compared 100 cases of laparoscopic Roux-en-Y gastric bypass from before high definition (BHD) to 100 cases after the change to high-definition (AHD) equipment by a single surgeon. We compared operating room times, age, sex, body mass index (BMI), and complications between groups. We also compared operating room times after excluding patients with any previous surgery.

Results: Age, BMI, and sex were not significantly different between groups. Mean operating room times were 77.1 minutes BHD and 77.6 minutes AHD, with no statistical difference ($P=0.737$, $n=200$). After excluding 132 patients with prior surgeries, mean operating room times were 78.0 minutes BHD and 78.8 minutes AHD, with no statistical difference ($P=0.849$, $n=68$). The overall 30-day complication rate between the 2 groups was 3 (3.1%) and 9 (9.0%), respectively ($P=ns$). No complications appeared to be the result of technical consequences of the operative field. No deaths occurred in this study.

Discussion: Although surgeons subjectively felt improvement in operative stress, the conversion to high definition did not translate into less operative time or improved outcomes.

41 Retrospective and Prospective Chart Review of Physician Quality Reporting System (PQRS) for Lower Back Pain

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Background: Lower back pain (LBP) is a common complaint in the general population and accounts for 2.5% of all outpatient office visits. Critical assessment and documentation of the frequency, parity, and the quality of LBP, as well as its physical finding and patient consultation are essential in understanding the symptoms and providing proper care. Medicare now requires records based on the PQRS guidelines for back pain. We hypothesized that lecturing on PQRS guidelines would improve clinicians' documentation and education about LBP.

Methods: We reviewed 100 charts (20 from each of 5 physicians) retrospectively to determine if documentation guidelines were met. The rheumatologists were lectured on PQRS guidelines, and we prospectively reviewed 100 (20 from each of 5 physicians) charts to determine not only if the guidelines were met, but also whether the documentation improved. Chart content included the initial comprehensive assessment using standardized assessment tools for pain and functioning status, physical examinations, and advice for normal activities and against bed rest.

Results: The percentages of physicians documenting comprehensive initial assessment, physical examination, and advice for normal activity and against bed rest prelecture were 34%, 46%, 55%, and 12%, respectively. Postlecture results were 23.3%, 27.5%, 23.95%, and 3.61%, respectively. Despite the lecture, documentation declined. The Epic EMR system was implemented shortly after the intervention began, which had a major impact on clinician's documentation and performance of quality care.

Discussion: The initial implementation of the EMR affected physician's documentation unfavorably. Steps need to be taken to improve the overall quality of care, patient experience, and clinic workflow.

42 The Pain Care Quality Indicator Study

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Background: Effective inpatient pain management is a challenge to balance comfort with functional independence. Nurses are essential in promoting quality pain management by assisting patients in identifying realistic comfort goals, administering analgesics, evaluating effects, and advocating for the patient. The purpose of this study was to assess patients' perceptions about the quality of pain management.

Methods: Pretests and posttests based on a 16-item survey and a structured interview were used to examine patients' reports of pain quality as part of a national multicenter study. Eligible patients from 5 units were consented. Pretest (G¹) findings directed intervention strategies (patient education, comfort goal discussion) to improve pain quality. Posttesting (G²) occurred 8 months after G¹.

Results: Data from 121 patients were analyzed. Mean age was 50.29 years ($SD=16.70$), 67 (55%) females. We found no differences between the G¹ (n=47) and G² (n=74) groups ($t=52$, $P>0.05$) in age or gender ($\chi^2=3.55$, $P>0.05$). Also, we found no group differences in mean 24-hour pain scores (G¹ $M=6.20$, $SD=2.26$; G² $M=7.29$, $SD=11.14$; $t=81$, $P>0.05$) or percent of time that pain was severe (G¹ $M=70.47$, $SD=25.72$; G² $M=67.23$, $SD=30.03$; $t=0.60$, $P>0.05$). Spearman's ρ detected associations ($P<0.01$) in both groups for nurses' belief of pain and 4 items: patient included in decisions (G¹ $r=0.42$, G² $r=0.40$), knows medication ordered (G¹ $r=0.42$, G² $r=0.36$), told medication side effects (G¹ $r=0.45$, G² $r=0.32$), and medication worked (G¹ $r=0.65$, G² $r=0.38$).

Discussion: Findings support nurses' belief that pain may drive quality indicators. The time between strategy implementation and G² measures limits conclusions about the benefit of intervention.

43 Risk Factors for Vancomycin-Resistant *Enterococcus* in a Posttransplant Population

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Background: We sought to identify factors that predispose posttransplant patients to vancomycin-resistant *Enterococcus* (VRE) infections and to compare clinical outcomes in patients with pathogenic VRE.

Methods: This retrospective chart review investigated factors that contribute to infection with VRE versus vancomycin-sensitive *Enterococcus* (VSE) in a population of posttransplant patients admitted to the hospital between April 2010 and December 2011 who received a positive culture for an *Enterococcus* species during that time. These study groups positive for VRE and VSE were compared to a control group from the same posttransplant population of randomly selected patients without enterococcal infection.

Results: Risk factors identified for VSE included length of stay in the hospital, biliary leak, and retransplantation. Risk factors identified for VRE included the chronic use of proton pump inhibitors, an organ from a CMV-positive donor, biliary leak, and the need for dialysis. With respect to outcomes, diagnosis with VRE was associated with an increased risk of mortality, although this difference was not statistically significant. Patients diagnosed with VRE had a significantly increased length of stay in the hospital and in the intensive care unit, as well as a higher rate of readmission to the intensive care unit.

44 Rapid Yeast Identification Methods and the Theoretical Cost Impact on Antifungal Deescalation

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Background: Invasive *Candida* infections have become increasingly more common and more difficult to treat. Current evidence demonstrates that the use of rapid yeast identification (ID) methods, followed by subsequent appropriate antifungal deescalation, results in cost savings and shortened hospital stays.

Methods: This retrospective review assessed the theoretical cost impact of rapid yeast ID methods on antifungal deescalation at a 520-bed tertiary referral center from April 15, 2010, to November 15, 2011. Yeast ID times for positive blood cultures and sterile body fluids were also assessed. Rapid yeast ID methods were not in use at the institution during the study period. Theoretical cost savings for pharmaceuticals were based on the average length of time to yeast ID found with the currently available rapid ID methods (72 hours). Once calculated, the theoretical cost savings were compared to the actual total pharmacy costs within the study period.

Results: A total of 148 yeast isolates from blood and sterile body fluids were included, of which 36.5% (54/148) were *C albicans* compared to 63.5% (94/148) of *C non-albicans* isolates. The time to final identification for *C non-albicans* versus *C albicans* was 10.5 days versus 7.1 days ($P < 0.0001$). The mean total cost was \$641.10 with current yeast ID methods, in which patients were not promptly and appropriately deescalated, versus a theoretical cost of \$590.90 with more rapid ID and antifungal deescalation ($P = 0.131$).

Discussion: Although results demonstrate a nonsignificant theoretical cost savings with earlier deescalation from an echinocandin to fluconazole, current yeast ID methods resulted in a higher-than-average time to final yeast speciation. Earlier identification and deescalation could still result in real cost savings to hospitals and patients. Implementation of more rapid yeast ID methods should be investigated.

45 Hydrogen Peroxide– Versus Glutaraldehyde-Based Systems for Disinfection of Vaginal Ultrasound Probes

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Background: Because of the complex process and the risk of errors associated with the glutaraldehyde-based solutions previously used at our institution for disinfection, our department has implemented a new methodology, the Trophon system (hydrogen peroxide based), for the high-level disinfection of vaginal ultrasound probes. The aim of this study was to compare the time difference, safety, and technologist's satisfaction of the Cidex (glutaraldehyde-based) and the Trophon (hydrogen peroxide-based) disinfection systems.

Methods: The Institutional Review Board approved a 14-question survey to be administered to the 13 ultrasound technologists in our department. Survey questions addressed a variety of aspects of the disinfection processes with graded responses over a standardized 5-point scale. A process diagram was developed for each disinfection method with segmental timing analysis, and costs were analyzed.

Results: Nonvariegated analysis of the survey data with Wilcoxon rank-sum test showed a statistical difference of survey responses in favor of the hydrogen peroxide-based system over the glutaraldehyde-based system regarding efficiency ($P=0.0013$), ease of use ($P=0.0013$), ability to maintain workflow ($P=0.026$), safety ($P=0.0026$), fixing problems ($P=0.0158$), time ($P=0.0011$), and overall satisfaction ($P=0.0018$). The glutaraldehyde-based disinfection system took 32 minutes versus 14 minutes for the hydrogen peroxide-based system; the hydrogen peroxide-based system saved an average of 7.5 hours per week. The cost of and weekly maintenance for the hydrogen peroxide-based system pay for themselves if 1.5 additional ultrasounds are performed each week.

Discussion: The hydrogen peroxide-based disinfection system was more efficient and viewed as easier and safer to use than the glutaraldehyde-based disinfection process. The adoption of the hydrogen peroxide-based system led to higher satisfaction among ultrasound technologists.

46 Voxel-Based Morphometry of Patients With Schizophrenia and Schizoaffective Disorders

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Background: Neuroimaging has shown that schizophrenia (SZ) and schizoaffective disorders (SD) are associated with neuroanatomic abnormalities, which are suggestive of diffuse brain pathology. Identifying the morphometry of SZ and SD is critical to understanding the etiopathophysiology in order to prescribe treatment. This study utilized voxel-based morphometry to investigate regional gray matter (GM) volume differences in SZ, SD, and healthy controls.

Methods: Fifty patients (22 SZ and 28 SD) and 47 controls were randomly selected. Ethical approval and consent were obtained. A Siemens (Malvern, PA) Sonata 1.5T scanner was used for imaging. T1-weighted MRI data were acquired using MP-RAGE sequences. VBM8 was used for comparing GM volume differences between groups. Multiple comparison error was corrected using family-wise error (FWE)-based correction ($P<0.05$).

Results: Regional GM decreases were identified in SZ patients at the ventromedial prefrontal cortex, the right and left temporal areas, and the somatosensory region in the left parietal lobe versus controls. SD patients demonstrated significant reductions in the mediadorsal frontal lobes and the left lateral temporal and parietal lobes, as well as the thalamic and cingulate regions. A comparison of SD and SZ found no differences with FWE. However, uncorrected ($P<0.001$) results indicated that SD patients had reductions in the thalamic and dorsal parietal regions compared to SZ patients, while SZ patients showed decreases in the ventral prefrontal cortex relative to SD patients.

Discussion: Different regions of reduced GM volume were identified in SZ and SD patients compared to controls. These regions are related to components of the pathoetiology underlying the symptoms and neuropsychological manifestations of schizophrenia.

47 Evaluation of Healthcare Providers' Adherence to Tobacco Prevention and Control Guidelines Pre- and Postimplementation of Education Modules

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Background: Tobacco use is the world's leading single preventable cause of death. Children exposed to second- and third-hand smoke are at risk for smoke-related morbidity. Pediatricians have an obligation to address tobacco use in their practices. The American Academy of Pediatrics (AAP) and the American College of Chest Physicians (ACCP) have published guidelines to assist physicians. We measured physician adherence to the AAP and ACCP guidelines on tobacco prevention, control, and treatment pre- and posteducational modules.

Methods: Charts were randomly selected from Ochsner's Pediatric clinics before and after the delivery of education modules that consisted of a review of the guidelines and available tools for implementing the guidelines. Pre- and postdelivery rates of adherence were measured.

Results: A total of 2,170 patient encounters were reviewed for preintervention analysis. Only 78 (4%) patients were screened for tobacco exposure. Of those families screened, only 6 (8%) were counseled. No parent was offered nicotine-dependence treatment, referral to the cessation clinic, or referral to quit lines. Pediatricians did not use appropriate billing codes. After intervention, 21 (31%) of the 67 charts reviewed documented screening for tobacco use. Six families (29%) were counseled about quitting. No patient was offered treatment or referral.

Discussion: Pediatricians are not adhering to tobacco prevention and control guidelines. Education modules may increase the rate of screening and counseling. Our intervention did not change the rate of treatment or referral to cessation programs. Better tools are needed to help pediatricians adhere to tobacco treatment guidelines.

48 Iron Metabolism in Mitochondrial Disorders

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Background: Mitochondrial disorders (MDs) affecting multiple systems are being diagnosed more frequently by geneticists because of advances in molecular and genetic testing. More than 200 genetic mutations have been found in the mitochondrial genome for disorders such as Alzheimer, Parkinson, and Huntington diseases and even diabetes mellitus. Mitochondrial defects can affect any organ or system in the body, but hematological changes associated with mitochondrial defects have not been studied extensively. Limited data exist on the association between hematological disorders and mitochondrial defects.

Methods: We performed a retrospective analysis of the medical records of children diagnosed with mitochondrial disorders for hematological and iron studies.

Results: We reviewed the charts of 6 children (1-19 years old) with mitochondrial disorders. Two had mild anemia (hemoglobin 10.8 g/dL and 10.7 g/dL). Three patients had low normal ferritin, and the other patient had values below normal. TIBC was elevated in 5 of the 6 patients. Saturated iron was low in all our subjects. None of the patients had classic symptoms of iron deficiency anemia, but all of them reported fatigue that was thought to be caused by MDs.

Discussion: Our very limited and retrospective review suggests an association between MDs and iron deficiency. Defective mitochondrial function may affect iron metabolism, and anemia or iron deficiency may enhance the symptoms and signs of MDs. A larger clinical review and more detailed biochemical and molecular study may be indicated because many of the enzymes and steps in iron metabolism depend on mitochondrial function. Because an iron deficiency state is a precursor of overt iron deficiency anemia, correcting the iron deficiency before iron deficiency anemia symptoms manifest may be beneficial. Pediatric geneticists and general pediatricians may want to obtain a baseline iron profile in their patients with MDs.

49 On Saying Goodbye

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Background: A clinical imperative exists to educate physicians on how to properly say goodbye when a patient is about to die. However, little to no formal training on the subject is available and very little is written in regard to how to say goodbye to a patient or the negative impact that miscommunication has on a last interaction.

Methods: We developed an internet-based questionnaire assessing house officers' knowledge and level of comfort with their patients' last encounters and administered it to 306 house officers through the hospital's internal HealthStream Learning Center (Nashville, TN).

Results: A total of 88 eligible participants completed the survey. The respondents were house officers for a mean of 2.5 years. Nearly half of the respondents (47%) were receiving internal medicine or subspecialty training. In a typical month, 61% of house officers reported encountering a patient at the end of life, and 45% reported any level of comfort with saying goodbye to a patient and his/her family. In terms of education on the subject, only 2% had read articles or conducted research. However 58.5% felt that they had some familiarity with the topic despite a lack of formal training.

Discussion: Our study identified specific gaps in the education of medical professionals. We found a notable dichotomy between what the residents reported they were familiar with and their acknowledgment that almost none had read articles or been specifically trained. Further research is necessary to explore the creation, content development, and implementation of such a curriculum.

50 Reducing Inpatient Falls: Prevention Is the Key to Patient Safety

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Background: Approximately 1 million inpatient falls occur in the United States each year. Maximizing fall prevention strategies requires the implementation of standardized evidence-based interventions that promote accountability, safety awareness, and employee empowerment throughout the organization. The purpose of this quality improvement project was to decrease the incidence of falls by implementing a multifactorial intervention program.

Methods: An interdisciplinary team used several plan-do-study-act cycles to reduce inpatient falls: (1) A fall risk assessment was conducted during each shift and communicated during bedside shift reports, (2) the fall prevention brochure and the contingency contract were reviewed daily with patients and families, (3) collaboration with physical/occupational therapists was promoted to create individual plans to reduce environmental hazards while improving mobility. Outcomes to measure success included compliance with daily education/contract and incidence of falls/1,000 patient days.

Results: Nursing compliance with the daily review of the fall prevention brochure and the contingency contract improved from 31% (July) to 90% (December). Fall rates consistently trended downward after the project began in June (January-June, 6.4/1,000 patient days) versus (July-December, 3.1/1,000 patient days). When compliance was lower, fall rates increased.

Discussion: The findings from this fall prevention project suggest that when staff compliance with fall prevention strategies was consistent, a reduction in falls was observed. Additional monitoring is required to measure the sustainability of outcomes in fall reduction.

51 Effects of a Fitness Program on Ochsner Employees Fighting Obesity: An Interim Report

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Background: Employees with chronic medical conditions associated with obesity, physical inactivity, and unhealthy lifestyle choices tend to have higher rates of absenteeism and illnesses. This study assesses the effect of an intensive, 90-day employee fitness program at Elmwood Fitness Center (EFC) on body weight in an obese employee cohort compared to a control group over a 1-year period. Secondary endpoints evaluate the program's effects on absenteeism rates, lipids, waist/hip ratio, heart rate, blood pressure (BP), and body mass index (BMI). This interim report gives partial results of the study after only 90 days.

Methods: Participants were eligible for the study if they were an Ochsner employee with a BMI ≥ 30 kg/m², passed a physical examination, and participated in the Virgin HealthMiles (VHM) program. The intervention consisted of weekly nutritional education, motivational interviewing, and participation in an exercise program customized and overseen by a personal trainer at EFC for 90 days.

Results: The 3-month follow-up data were collected for 49 participants. Their mean baseline weight decreased from 229.5 lbs (SD \pm 38.1) to 218.4 lbs (SD \pm 35.3) ($P < 0.001$). Systolic BP decreased from 121.0 mmHg (SD \pm 9.14) to 118.1 mmHg (SD \pm 8.4) ($P < 0.04$), and diastolic BP decreased from 81.2 mmHg (SD \pm 8.4) to 77.4 mmHg (SD \pm 7.7) ($P < 0.001$). We found no statistically significant changes in total cholesterol, high-density lipoprotein, waist/hip ratio, or heart rate.

Discussion: An intensive 90-day fitness program was associated with significant additional weight reduction and improvement in BP control in obese employees already participating in the VHM program.

52 Sex Differences in Barriers to Antihypertensive Medication Adherence: Findings From the Cohort Study of Medication Adherence in Older Adults (CoSMO)

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Background: We assessed whether sociodemographic, clinical, healthcare system, psychosocial, and behavioral factors are differentially associated with low antihypertensive medication adherence scores among older men and women.

Methods: We conducted a cross-sectional analysis using baseline data from the Cohort Study of Medication Adherence in Older Adults (n=2,194). Low antihypertensive medication adherence was defined as a score < 6 (8-item Morisky Medication Adherence Scale). Risk factors for low adherence were collected using telephone surveys and administrative databases.

Results: The prevalence of low medication adherence scores did not differ by sex (15.0% in women and 13.1% in men; $P = 0.208$). In sex-specific multivariable models, issues with medication cost and fewer lifestyle modifications for blood pressure control were associated with low adherence scores in both sexes. Factors associated with low adherence scores in men but not women included reduced sexual functioning (OR=2.03; 95% CI: 1.31, 3.16 for men and OR=1.28; 95% CI: 0.90, 1.82 for women), and BMI ≥ 25 kg/m² (OR=3.23; 95% CI: 1.59, 6.59 for men and 1.23; 95% CI: 0.82, 1.85 for women). Factors associated with low adherence scores in women but not men included dissatisfaction with communication with their healthcare provider (OR=1.75; 95% CI: 1.16, 2.65 for women and OR=1.16 95% CI: 0.57, 2.34 for men) and depressive symptoms (OR=2.29; 95% CI: 1.55, 3.38 for women and OR=0.93; 95% CI: 0.48, 1.80 for men).

Discussion: Factors associated with low antihypertensive medication adherence scores differed by sex.

53 Low Antihypertensive Medication Adherence Is Associated With Increased Risk of Cardiovascular Events in Older Women and Men: Findings From the Cohort Study of Medication Adherence in Older Adults (CoSMO)

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Background/Objective: Using data from the Cohort Study of Medication Adherence in Older Adults, we assessed the risk of CV events associated with low pharmacy fill rates among 2,048 older adults treated for hypertension.

Methods: We calculated the medication possession ratio (MPR) for antihypertensive medications filled the year prior to the baseline survey for each participant using data from administrative pharmacy databases. Low, medium, and high adherence were defined as an MPR <0.5, 0.5 to <0.8, and ≥ 0.8 , respectively. CV events (stroke, myocardial infarction, and chronic heart failure) were identified in administrative databases and adjudicated by clinicians. Cox proportional hazards analysis was used to determine the risk of CV events associated with low or medium MPR.

Results: The mean age of participants was 75.0 ± 5.6 years, 60.1% were female, 30.5% were African-American, and 63.1% had been diagnosed with hypertension for 10 or more years. The prevalence of low, medium, and high MPR was 3.6%, 22.8%, and 73.6%, respectively. A total of 217 (10.6%) participants had a CV event over a median of 3.8 years of follow-up. Crude incidence rates for CV events by low, medium, and high MPR were 17.6%, 12.9%, and 9.6%, respectively ($P=0.005$). After multivariable adjustment and compared to those with high MPR, the hazard ratios (95% confidence interval) for CV events associated with medium and low MPR were 1.28 (0.94, 1.74; $P=0.119$) and 2.47 (1.38, 4.43; $P=0.002$), respectively.

Discussion: Among older adults with hypertension, low adherence to antihypertensive medications was associated with an increased risk of CV events.

54 Predicting Low Pharmacy Refill Adherence in Elderly Patients With Uncontrolled Blood Pressure

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Background: We developed and evaluated a short self-report tool to predict low pharmacy refill adherence in older patients with uncontrolled hypertension.

Methods: Cross-sectional analyses of survey and administrative data from the Cohort Study of Medication Adherence in Older Adults were conducted on 394 adults with uncontrolled blood pressure. We considered 164 self-reported candidate items for the development of a prediction rule for low (<0.8) vs high (≥ 0.8) medication possession ratios (MPRs) from pharmacy refill data. Risk prediction models were evaluated using best subsets analyses, and the final model was chosen based on clinical relevance and model parsimony. Bootstrap simulations assessed internal validation. The performance of the final model was compared to the 8-item Morisky Medication Adherence Scale (MMAS-8) and the 9-item Hill-Bone Compliance Scale.

Results: Of the study participants, 33.0% were black, 66.0% were women, 23.4% had low MPR, and the mean age was 76.6 ± 5.6 years. A 4-item self-report tool predicting pharmacy refill adherence showed moderate discrimination (C-statistic=0.704, 95% CI=0.683, 0.714) and good model fit (Hosmer-Lemeshow χ^2 $P=0.743$). Sensitivity and specificity were 67.4% and 67.8%, respectively. The C-statistics for MMAS-8 and the Hill-Bone Compliance Scale were 0.665 (95% CI=0.632, 0.683) and 0.660 (95% CI=0.622, 0.674), respectively.

Discussion: A 4-item self-report tool moderately discriminated low from high pharmacy refill adherers, and its test performance was comparable to existing adherence scales. Parsimonious tools to identify low adherers among patients with uncontrolled blood pressure may facilitate the tailoring of interventions to improve blood pressure control in the elderly.

55 Severe Sepsis and Septic Shock: Worse Outcomes Seen in Patients Transferred to the Intensive Care Unit From Wards Compared to Transfers From the Emergency Department

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Background: In-hospital transfer of septic patients to the ICU has been associated with higher mortality and length of stay (LOS) compared to direct admits from the emergency department (ED).

Methods: This prospective study enrolled 902 consecutive patients admitted to the MICU from July 1, 2008, to March 31, 2012, with a diagnosis of sepsis. This study resulted from a multidisciplinary team quality improvement project involving ED and ICU sepsis bundles that focused on early goal-directed therapy. We then evaluated the difference in mortality between patients admitted to the ICU from the general medical/surgical wards and from the ED with sepsis who were treated with bundled order sets.

Results: A total of 767 patients were evaluated for in-hospital mortality outcomes stratified by location: ED vs general medical/surgical ward. We found that 606 (79%) patients were diagnosed in the ED compared to 161 (21%) on the wards. Baseline characteristics were similar between groups, including average APACHE scores (ED: 23.4 ± 8.7 vs floor: 23.9 ± 7.4 , $P=0.56$). In-hospital mortality was lower in patients diagnosed in ED vs floor (17.3% vs 24.8%, respectively, $P=0.03$). Additionally, significantly shorter LOS was demonstrated in the ED group (9.3 ± 8.5 days vs 13.9 ± 11.4 days, $P<0.001$). Goals met at 6 hours (71.3% vs 57.8%, $P<0.001$) and antibiotics within 2 hours of diagnosis (81% vs 41%, $P<0.001$) occurred significantly more frequently in patients diagnosed in ED.

Discussion: Patients who develop severe sepsis and septic shock on the wards have increased in-hospital mortality and hospital LOS, possibly because of a less streamlined care process and a delay in antibiotic administration. Processes to identify these patients earlier and improve timely resuscitation and time to antibiotics may lead to better outcomes for this cohort.

56 Exploring the Role of Technology in Monitoring Compliance With the Head-of-Bed Component of the Ventilator-Associated Pneumonia Bundle

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Background: Ventilator-associated pneumonia (VAP) is responsible for 25% of critical care hospital-acquired infections. VAP prevention bundles are interventions assembled together to streamline care processes and include head-of-bed (HOB) elevation $\geq 30^\circ$, daily sedation vacation, stress ulcer and deep venous thrombosis prophylaxis, and chlorhexidine oral care. Although reports describe decreased VAP rates with bundled interventions, HOB compliance has been difficult to measure. The purpose of this pilot project was to explore the use of technology in monitoring compliance with the HOB bundle component in critical care patients.

Methods: An HOB electronic device was applied to 11 beds using a pre/post design. HOB compliance was continuously monitored for each device over 5 days for each group (monitoring vs monitoring with alert). Baseline compliance was monitored (Group 1), followed by monitoring with a lighted indicator alerting nurses to a bed angle $<30^\circ$ (Group 2). Compliance was defined as the number of minutes that HOB was $\geq 30^\circ$ divided by the total number of monitored minutes.

Results: The mean monitored time was $5,440.2 \pm 667.1$ minutes for Group 1 ($n=48$) and $7,116.2 \pm 3,096.2$ minutes for Group 2 ($n=49$). The mean HOB compliance time was 523.1 ± 417.8 minutes in Group 1 and 853.7 ± 399.4 minutes in Group 2. Group 2 was compliant 74.1% of the time and 27.9% more compliant than Group 1 ($t=4.46$, $P<0.001$).

Discussion: Findings suggest a potential benefit in using an electronic tracking device to monitor and improve nurses' compliance with the HOB component of the VAP bundle.

57 Who Helps the Most With Diabetes Care Is Associated With Diabetes Control

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Background: Many patients with type 2 diabetes seek help with care from someone. Whether the specific source of help with diabetes care is associated with better diabetes control is unclear. We sought to determine if the source of most help in diabetes care is associated with patients' glycosylated hemoglobin (A1C) levels.

Methods: We performed a cross-sectional analysis of survey data using questions from the Michigan Diabetes Research and Training Center Diabetes Care Profile in an endocrinology outpatient clinic to examine A1C levels. Our inclusion criteria were age >21 years, being English literate, and having a type 2 diabetes diagnosis. A total of 225 patients were eligible for the study, and 206 patients completed the survey (91% response).

Results: The mean age of patients was 60.8 ± 12.63 years, 44.2% were male, 36.9% were African-American, 61.7% were married, and 29.6% had earned a 4-year college degree. The mean body mass index was 33.2 ± 7.5 kg/m², 49.0% had a diabetes duration of >10 years, and 30.0% had A1C <7%. Of the 206 respondents, 26% identified a spouse as their source of most help, 21% a nonspouse family member or friend, 35% a healthcare worker, and 18% themselves. After adjustment for age, gender, race, marital status, education, diabetes duration, and medication adherence, mean A1C level by the source of most help was spouse, $7.6\% \pm 0.34\%$; nonspouse family or friend, $9.0\% \pm 0.34\%$; healthcare worker, $7.5\% \pm 0.25\%$; and self, $7.3\% \pm 0.35\%$. Those receiving help from nonspouse family or friends had significantly higher A1C levels than all other groups ($P < 0.05$ for each comparison).

Discussion: Patients with diabetes who depend on their spouse, healthcare worker, or self for care have similar A1C levels; however, those patients who depend on nonspouse family or friends have higher A1C. A better understanding of sources of help with diabetes care may facilitate disease management and improve clinical outcomes.

58 Systemwide Strategies to Increase the Percentage of Infants Breastfed in the Ochsner System

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Background: The Healthy People 2020 goal for infants being breastfed at some point is 81.9%. The Centers for Disease Control and Prevention reported in Louisiana only 53.5% of infants are ever breastfed. The purpose of this project was to increase the percentage of infants in the Ochsner system who received any human milk.

Methods: The system lactation council developed a 3-pronged strategy to improve breastfeeding initiation rates among mothers of term infants and breastpumping initiation rates within 6 hours of a preterm delivery. Strategies included (1) parent and staff education regarding breastmilk benefits for term and preterm infants, (2) skin-to-skin contact (mother/term infant) within 1 hour of delivery, and (3) facilitation of breastpumping initiation within 6 hours of preterm delivery. Staff compliance, breastfeeding initiation rates of term infants, and breastpumping initiation rates of mothers of preterm infants were continuously monitored and reported monthly.

Results: Although some facilities do not monitor certain indicators, individual facility metrics varied and included staff compliance with offering skin-to-skin contact (Jefferson, 63%; Kenner, 55%; Westbank, no data; Baton Rouge, 84%; St. Anne, no data; Northshore, 33.5%) and assisting mothers with breastpumping within 6 hours of preterm births (Jefferson, 61%; Kenner, 20%; Westbank, 50%; Baton Rouge, 66%; Northshore, 42%). Breastfeeding initiation rates improved (Jefferson, from 70% to 76%; Kenner, from 60% to 68%; Westbank, from 47% to 57%; Baton Rouge, from 52% to 66%; St. Anne, from 37% to 55%; Northshore, from 58% to 66%).

Discussion: Although breastfeeding initiation rates improved over time, our findings support the need for improved staff compliance with lactation initiatives and a standardized educational program to promote cultural awareness of the benefits of breastmilk among parents and staff in order to meet national goals.

59 Small Troubles, Adaptive Responses (STAR-2): Frontline Nurse Engagement in Quality Improvement

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Background: Preventable medical errors cost approximately \$17 billion each year. Therefore, leveraging front-line nurses in identifying operational failures (OFs) is critical to growing a safety culture. The goals of this study were to describe unit-based OFs and to investigate relationships among the detection, organizational context, and outcomes of OFs related to quality improvement and safety.

Methods: This study was part of a multisite cross-sectional investigation. A convenience sample of nurses from 3 units (Mother/Baby, Cardiology, Med/Surg) prospectively identified OFs over 20 days and completed surveys about organizational outcomes and safety.

Results: Data were analyzed from 373 pocket cards from 67 nurses and 57/67 (85%) survey packets. A total of 2,579 OFs representing 344 shifts were identified. OFs were ranked and categorized into 6 groups: equipment/supplies (31%), staffing/training (20%), medication (16%), other (14%), information/communication (10%), and physical unit/layout (9%). The Mother/Baby Unit reported more staffing/training OFs— $F(2, 63)=5.86, P<0.05$ —and fewer medication-related OFs— $F(2, 63)=3.18, P<0.05$ —than the other 2 units. Overall, day shifts reported an average of 7.43 OFs, while night shifts reported 5.97 ($P=ns$). We found significant differences in OFs between day and night shifts in the physical unit/layout, information/communication, and staffing/training categories: $t(370)=3.01, t=3.65, t=3.22, P<0.01$, respectively). Survey responses were neutral regarding safety, and respondents agreed that the environment supported nurses' work.

Discussion: Nurses identified the majority of OFs in the categories of equipment/supplies and staffing/training, which directly impact quality outcomes. Nurses' active engagement in solution identification is warranted.

60 Patient Preferences on Doctor Attire

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Background: The white coat's place within the medical profession is a heavily debated topic. Five years after the bare-below-the-elbow policy took effect in England, we reexamined the evidence against coats and explored our patients' opinions about doctor attire to weigh patient preferences against theoretic concerns over the risk of disease transmission.

Methods: A survey was administered at 3 locations within the Ochsner system (hospital clinic, satellite clinic, and inpatient ward) in 2013. The survey assessed patient preferences regarding white coats and included 4 images of the same doctor in different attire: traditional white coat, bare-below-the-elbow attire, coat with scrubs, and scrubs alone. Respondents rated images head to head for preference and individually to indicate their confidence in the physician's skills and their comfort level with the physician based on the displayed attire. Attitudes were then reassessed after information about potential disease transmission was given to patients.

Results: Overall, 69.9% of 153 patients surveyed preferred that doctors wear white coats. When locations were compared, a statistically higher proportion of outpatients preferred coats ($P=0.001$); the trend was most pronounced between hospital clinic patients (84%) and ward inpatients (51.9%; $P<0.001$). Patients disliked bare-below-the-elbow attire, scoring it lowest on comfort and confidence scales (0.05 and 0.09, respectively). Information regarding the risks of coat-carried infections did not influence respondents' opinions, and 87.9% would still feel comfortable with a doctor who wore one.

Discussion: These findings suggest that patients prefer white coats, which contributes to having greater comfort and confidence in their physicians, despite knowledge of theoretic concerns about disease transmission.

C1 The New AIDS Chameleon?

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Case Report: A 58-year-old African-American female with type 2 diabetes mellitus and a history of *Nocardia asteroides* brain abscesses presented with generalized weakness, lethargy, slurred speech, and left-sided facial droop. The emergency department initiated a stroke protocol. Magnetic resonance imaging demonstrated diffuse nodular leptomeningeal enhancement within the posterior fossa and left facial nerve enhancement at the cerebellopontine angle without evidence of mass effect or infarction. Serum studies revealed white blood cell (WBC) count of 3,890 cells/mm² (neutrophils 82%, lymphocytes 5.2%). Cerebrospinal fluid (CSF) analysis revealed a WBC count of 1,388 cells/mm² (neutrophils 94%), protein of 177 mg/dL, glucose of 196 mg/dL, opening pressure of 24 cm H₂O, and an elevated cryptococcal antigen titer of 1:128. Blood and CSF cultures both resulted in heavy growth of *Cryptococcus neoformans*. The absolute CD4 count was 80 cells/ μ L. Her HIV ELISA and Western blot tests were both negative. Complement immunoglobulins and CD3, 19, 20, and 45 were unremarkable. Liposomal amphotericin B and flucytosine were administered for 18 days. A decision was made to check her serum gamma interferon autoantibody (IFN- γ) level which was elevated at 1.5 pg/mL (normal <0.3 pg/mL).

Discussion: Recently described cases suggest a new, cell-mediated immunodeficiency distinct from HIV/AIDS that presents with nontuberculous mycobacterium and disseminated fungal infections. Adult-onset immunodeficiency is not a virus and is noninfectious in etiology. While previously described patients with these characteristics were living in Asia or of Asian descent, our patient is an African-American living in the southeastern United States. This case stresses the significance of looking for other primary immunodeficiencies in an HIV-negative, nonimmunosuppressed patient with repeated opportunistic infections.

C2 A Rare Case of Erythromycin-Induced Acute Pancreatitis

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C3 Toxic Epidermal Necrolysis Following Treatment With R-CHOP Chemotherapy Regimen: A Case Report

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Background: Diffuse large B-cell lymphoma (DLBCL) is the most common subgroup of non-Hodgkin lymphoma. CHOP (cyclophosphamide, doxorubicin, vincristine, and prednisone) chemotherapy remains the standard treatment. The addition of rituximab to the CHOP regimen (R-CHOP) significantly decreases mortality.

Case Report: A 65-year-old female with DLBCL presented to the hematology/oncology clinic 10 days after receiving her first dose of R-CHOP. She had a diffuse erythematous, papulovesicular rash involving her torso, upper extremities, and face. She initially received acyclovir for presumed herpes zoster. She subsequently presented to the emergency department with a diffuse bullous eruption of vaginal and perianal ulcerations. A punch biopsy revealed epithelial necrosis with detachment from the underlying dermis and perivascular lymphoid infiltrates, consistent with Stevens-Johnson syndrome. A diagnosis of toxic epidermal necrolysis (TEN), attributable to rituximab, was established given the clinical correlation of mucous membrane involvement as well as involvement of >30% body surface area. After receiving fluid resuscitation, prophylactic antibiotics, and a short course of IVIG, the patient was transferred to a burn center for supportive care.

Discussion: After recovery, the patient continued treatment for her DLBCL with CHOP therapy but not rituximab. In a review of the literature, 2 other cases have reported this rare, but medically important, side effect of rituximab.

C4 Intraventricular Hydatid Cyst Presenting as Exacerbation of Dilated Cardiomyopathy

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Background: Hydatid cysts involve *Echinococcus granulosus*, commonly known as dog tapeworm. This infectious disease is usually found in developing nations. Cysts can occur in practically any part of the body, but common sites are the liver, lungs, kidneys, and brain. Cysts are also reported in the heart, especially intramurally and in the pericardium, but intraventricular cysts have never before been reported. Cardiac hydatid cysts usually present with symptoms of cardiac insufficiency such as angina and exertional dyspnea. Intramural hydatid cysts can be effectively managed surgically followed by postoperative albendazole.

Case Report: We report the first case of hydatid cyst in the left ventricular cavity that was successfully treated with oral albendazole without surgical intervention. The patient remained asymptomatic at the end of 12 months of albendazole therapy. Follow-up echocardiography showed no evidence of cystic lesions in the left ventricle.

C5 Juvenile Granulosa Cell Tumor in a Newborn With an Undescended Testicle

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Case Report: A 2-week-old infant was referred for urologic evaluation for right cryptorchidism. He was born at 39 weeks gestational age via cesarean section, and the right testicle was not initially palpable. Ultrasound revealed a size discrepancy between the testicles, with the right side measuring 70% larger than the left. His tumor markers revealed an AFP level of 35,000, which failed to decline appropriately.

At 1 month of age his right testicle had descended spontaneously, but the size discrepancy persisted. Because of the size discrepancy between the testicles, as well as the failure of the AFP level to decline, the patient underwent an inguinal orchiectomy at 3 months of age. The final pathologic diagnosis revealed PT1 juvenile granulosa cell tumor (JGCT) with negative surgical margins. The patient was then followed clinically, and the AFP values progressively declined.

Discussion: JGCT usually presents as a painless, cystic mass that is hormonally inactive. To date, only about 50 cases have been described in the literature since its recognition in 1983. Of these cases, 90% have been diagnosed in children younger than 1 year. Up to 25% of these patients also have an associated chromosomal abnormality. To date, there have been no reports of metastases with JGCT. No follow-up is currently recommended for these patients.

C6 T-Cell Lymphoma of the Testicle: A Rare Case Report

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Background: Testicular tumors account for 1% of all tumors in males. Lymphoma accounts for 5% of all testicular tumors but accounts for the majority of testicular tumors in men over the age of 50. Only 1%-2% of all non-Hodgkin lymphomas present as primary testicular tumors, and most of these lymphomas are of the B-cell type. Very few cases of testicular T-cell lymphoma have been documented in the literature, and the disease typically has a very poor prognosis.

Case Report: A 78-year-old male with a medical history of hypertension, diabetes, coronary artery disease, and prostate cancer on active surveillance presented to the clinic with a complaint of 2 weeks of painless left testicular swelling. Physical examination revealed a hard, indurated, and enlarged left testicle. Scrotal ultrasound showed a predominantly hypoechoic 3.5 × 3.1 × 2.9 cm hypervascular mass within the left testicle. Serum LDH, AFP, and βHCG were within normal limits. He subsequently underwent a left inguinal orchiectomy with the final pathology showing peripheral T-cell lymphoma of the left testicle. Computed tomography of the chest, abdomen, and pelvis, as well as positron emission tomography, showed no evidence of metastatic disease. Bone marrow biopsy and lumbar puncture were negative for malignancy.

Discussion: This case raises awareness of the rare diagnosis of testicular T-cell lymphoma. The prognosis is very poor, with a 35% 5-year survival rate despite treatment. These tumors tend to recur, particularly in the central nervous system. Evaluation should always include a lumbar puncture and bone marrow biopsy. Treatment is typically chemotherapy with cyclophosphamide, doxorubicin, vincristine, and prednisolone.

C7 Spontaneous Closure of a Macular Hole Associated With Uveitis

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C8 Anemia Secondary to Idiopathic Pulmonary Hemosiderosis in a 6-Year-Old

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Case Report: A 6-year-old African-American male with a history of recurrent pneumonia (at varying sites and often bilateral) associated with occasional bouts of hemoptysis was referred to the pediatric hematology/oncology clinic for anemia with Hb=8.6 g/dL. These symptoms had been present on and off for nearly 3 years, and he had been evaluated at several hospitals by a multitude of specialists; work-ups were negative for malignancy, tuberculosis, immunodeficiency, and congenital anomalies in the upper airway. He had received a few transfusions earlier because his hemoglobin had decreased to 3.2 g/dL. His iron studies showed high ferritin with low serum iron, increased TIBC, low saturation, and mild elevation of FEP. He was started on oral supplemental iron with an excellent response. His immunoglobulin levels were normal, and his RAST antibody for milk was weakly positive. Chest x-ray showed bilateral infiltrates and possible consolidation. The patient continued to have hemoptysis, and computed tomography during a follow-up visit showed multifocal, asymmetrical, bilateral ground-glass opacities. Bronchoscopy with bronchoalveolar lavage confirmed the presence of hemosiderin-laden macrophages consistent with pulmonary hemosiderosis. He had iron deficiency anemia with low serum iron but high ferritin, which may have been caused by the pulmonary macrophages that store the iron without releasing it to the bone marrow and or the inflammatory process. Extensive work-ups for Wegener granulomatosis and autoimmune diseases were negative. His anemia responded well to oral iron, but his chest x-ray and pulmonary manifestations have not improved. The pulmonologist is planning a lung biopsy and may change medications for immune suppression.

Discussion: The prevalence of idiopathic pulmonary hemosiderosis (IPH) is thought to be between 0.24 to 1.23 cases per million. We present an unusual case of recurrent pulmonary infiltrates with iron deficiency caused by IPH, which is usually a diagnosis of exclusion and not often looked for by most primary care providers. Hemoptysis with wandering pneumonia, normal immunologic function, and normal ferritin are important clues that should warn us to look for an unusual cause.

C9 A Multidisciplinary Approach for a Newborn With a Large Cervical Teratoma and Hypoplastic Left Heart Syndrome

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Background: Cervical teratoma and hypoplastic left heart syndrome are life-threatening congenital anomalies that require a multidisciplinary approach for optimal outcomes. Our infant presented 1 day prior to delivery and required a rapid, coordinated plan for management.

Case Report: A 20-year-old G2P1 at estimated gestational age of 36 weeks and 4 days was admitted to Labor and Delivery upon diagnosis of a fetal neck mass and a congenital heart defect. Ultrasound showed a neck mass measuring 10.5 × 10.4 × 9.5 cm and a single ventricle with L-transposition of the great arteries. Magnetic resonance imaging showed the mass invading the airway at the level of the larynx. The day after admission, the mother experienced preterm labor. Cesarean section was performed with the ex-utero intrapartum treatment (EXIT) procedure used to manage the infant's airway. After uterine incision but before separation from the placental circulation, the pediatric ENT intubated the newborn. At 5 days of age, the infant underwent PA banding that was immediately followed by resection of the neck mass. At 13 days of age, the infant was extubated. The infant was later discharged home in stable condition.

Discussion: The EXIT procedure has been established to manage a variety of fetal conditions, including cervical teratoma. A concomitant heart defect is rare in congenital cervical teratoma patients. The EXIT procedure uses high-dose inhalation anesthesia to maximize uterine relaxation and uteroplacental circulation. Despite the risk of deleterious effects of volatile anesthetics on myocardial contractility and heart rate, our infant tolerated high-dose desflurane without circulatory compromise after delivery. Subsequently, effective coordination of care allowed for optimal outcome.