LSU DEPARTMENT OF ORTHOPAEDIC SURGERY

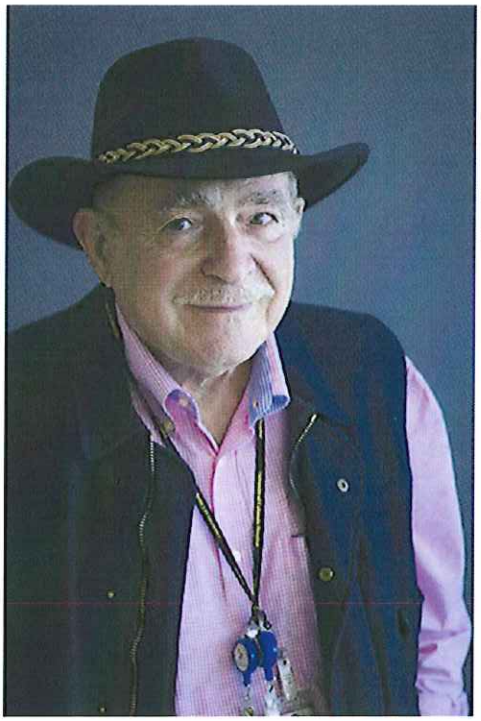
Saturday, June 17, 2017
The LSUHSC Learning Center
Lion's Building – 2020 Gravier Street
6TH Floor – Room #632

Faculty, Residents, & Staff 2016

14th ANNUAL ROBERT D. D'AMBROSIA LECTURESHIP & RESEARCH DAY

The Lectureship and Research is named in honor of:

Robert D. D'Ambrosia, M.D.



Dr. D'Ambrosia service to the LSU department of Orthopaedic Surgery has spanned over 30 years. While Chair of the Department, he trained and mentored over 100 LSU graduates. His contributions to the LSU program is long lasting and a lectureship and chair have been established in his honor. We are very grateful for Dr. D's contributions to LSU and to the department. He exemplifies leadership and humanity and we are proud to honor his legacy with our Fourteenth year of Lectureship Series.

AGENDA

7:30 am- 8:00 am	Continental Breakfast
8:05 am - 8:15 am	**Vinod Dasa, MD/ Director of Orthopaedic Research** Introduction
8:15 am – 8:35 am*	**Guest Speaker: Robert L. Satcher Jr., Ph.D., M.D.** *Tumors*
8:40 am – 8:50 am*	**Amir Abdul-Jabbar, M.D.** *Clinical Outcomes after Lateral Approach Interbody Fusion: A Systematic Review.*
8:55 am - 9:05 am*	**Bryce A. Fugarino, M.D.** *Single-Use Sets for Volar Distal Radius Plating are Currently Less Cost Effective than Conventional Sets.*
9:10 am – 9:20 am	**BREAK**
9:25 am – 9:35 am*	**Lindsey G. Liuzza, M.D.** *Database Analysis of Early Complications and Costs Associated With Operative and Nonoperative Treatment of Proximal Humerus Fractures in Privately Insured Patients.*
9:40am – 9:50 am*	**Harry J. Molligan IV., M.D.** *Evaluation of Incidences of Heterotopic Ossification within the LSU Hospital System.*
9:55 am – 10:05 am*	**Pouya Alijanipour, M.D.** *Radiographic Comparison of Patient-Specific (PS) and Manually Contoured Conventional © Rods in Adolescent Idiopathic Scoliosis (AIS) Surgery.*
10:10 am – 10:20 am*	**Linus Igbokwe, Student Researcher** *Impact of Medicaid Expansion on Access to Orthopaedic Care in Louisiana.*

10:25 am – 10:55 am*	**David Satharaj, Ph.D.** *Opportunities for Predictive Analytics and Big Data Visualization in Healthcare.*
11:00 am – 11:20 am*	**Guest Speaker: Robert L. Satcher Jr., Ph.D., M.D.** *Space Experience*
11:25 am – 11:45 am*	**Visitor** – Dr. Yingze Zhang
11:50 am	**Closing Remarks**

*Denotes 5 minutes of Q & A

12:00 noon – Lunch (Mother's Restaurant – 401 Poydras St.) with Guest Speaker(s), Faculty, & PGY-4 Residents

GUEST SPEAKER

Robert L Satcher, Jr, Ph.D., M.D.

Topics: *Tumors & Space Experience*

Primary Appointment

Assistant Professor, Orthopaedic Oncology, Division of Surgery, The University of Texas MD Anderson Cancer Center, Houston, TX

EDUCATION: Dr. Satcher graduated from Denmark-Olar High School, Denmark, South Carolina, in 1982. He received a bachelor of science degree in chemical engineering from Massachusetts Institute of Technology in 1986; a doctor of philosophy in chemical engineering from MIT in 1993 and a doctor of medicine degree from Harvard Medical School in 1994. Dr. Satcher completed his internship and residency in orthopaedic surgery at the University of California, San Francisco, in 2000; postdoctoral research fellowships at MIT in 1994 and University of California, Berkeley in 1998; and a fellowship in musculoskeletal oncology at the University of Florida in 2001.

PROFESSIONAL QUALIFICATIONS: American Board of Orthopaedic Surgery; Illinois Medical License; Texas Medical License; Medical Board of California: Physicians and Surgeon's Certificate; National Board of Medical Examiners; DEA Authorization; Medical Board of California: Physician Assistant Supervisor; California Fluoroscopy X-Ray Supervisor and Operator; ATLS and CPR Certifications; Professional Association of Divers International (SCUBA)

ORGANIZATIONS: American Academy of Orthopaedic Surgeons, Musculoskeletal Tumor Society, American Academy of Cancer Research, Connective Tissue Oncology Society, National Medical Association, Society of Black Academic Surgeons, Doctors United in Medical Missions, National Comprehensive Cancer Network, Orthopaedic Research Society, MIT Alumni Association, Black Alumni at MIT, Harvard Alumni Association

SPECIAL HONORS: Leadership Fellow of American Academy of Orthopaedic Surgeons, ABC Fellow of American Orthopaedic Association, UNCF/Merck Research Fellow, Robert Wood Johnson Foundation Fellow, Bloomberg Leadership Fellow, Johns Hopkins University, Tau Beta Pi Engineering Honor Society

Dr. Satcher completed 12 research grants from 1991 to 2004. He has 15 peer-reviewed publications and more than 25 presentations at national and international research meetings.

NON-MEDICAL ACTIVITIES AND INTERESTS: Dr. Satcher has been active in numerous community organizations including Big Brother for Youth at Risk Counseling Program, Department of Corrections, San Francisco, California; Tutor for Black Student's Union Tutorial Program, MIT; National Society of Black Engineers; American Institute of Chemical Engineering; Supervising Adult for Cub Scout Camp for Boys, Nashville, Tennessee; Open Airways Tutor (asthma awareness); Proctor for Freshman Dormitory at Harvard University, Cambridge, Massachusetts; Lay Episcopal Minister (primary responsibility is visiting sick and shut-in members of the church) at St. Edmund's Episcopal Church, Chicago, Illinois and at St. James Episcopal Church in Houston, Texas.

EXPERIENCE: Assistant Professor at The Feinberg School of Medicine, Northwestern University, in the Department of Orthopaedic Surgery. Dr. Satcher also held an appointment as an Attending Physician in Orthopaedic Surgery at Children's Memorial Hospital in Chicago, Illinois, specializing in Musculoskeletal Oncology and an Adjunct Appointment in The Biomedical Engineering Department at Northeastern University School of Engineering. Dr. Satcher was also a member of the Robert H. Lurie Comprehensive Cancer Center and the Institute for Bioengineering and Nanotechnology in Advanced Medicine at Northwestern University. Prior to this, he completed clinical fellowships in Musculoskeletal Oncology at the University of Florida and as a Schweitzer Fellow at the Albert Schweitzer Hospital, Lambarene, Gabon. Dr. Satcher also completed numerous medical missions for outreach care to underserved areas in Nicaragua, Venezuela, Nigeria, Burkina Faso, and Gabon. Prior experience in engineering includes internships at E.I. DuPont deNemours & Company, Inc., Wilmington, Delaware, in the Textile Fibers Research Group, and the Polymer Products Division.

NASA EXPERIENCE: Dr. Satcher was selected by NASA in May 2004 to be an Astronaut Candidate. In February 2006, he completed Astronaut Candidate Training that included scientific and technical briefings, intensive instruction in shuttle and International Space Station systems, physiological training, T-38 flight training and water and wilderness survival training. Dr. Satcher flew on STS-129 in November 2009 and has logged more than 259 hours in space, including 12 hours and 19 minutes in two EVAs. Dr. Satcher left NASA in September 2011 and currently is on staff as a Surgical Oncologist at MD Anderson Cancer Center in Houston, Texas.

SPACE FLIGHT EXPERIENCE: STS-129 (November 16 to November 29, 2009) was the 31st shuttle flight to the International Space Station. During the mission, the crew delivered two Express Logistics Carriers (ELC racks) to the International Space Station and approximately 30,000 pounds of replacement parts for systems that provide power to the station, keep it from overheating, and maintain proper orientation in space. During the mission, Dr. Satcher performed two spacewalks for a total of 12 hours and 19 minutes of EVA. The STS-129 mission was completed in 10 days, 19 hours, 16 minutes and 13 seconds, traveling 4.5 million miles in 171 orbits, and returned to Earth, bringing back NASA Astronaut Nicole Stott, following her tour of duty aboard the International Space Station.

David Sathiaraj, Ph.D.

Topic: *Opportunities for Predictive Analytics and Big Data Visualization in Healthcare.*

David Sathiaraj has a PhD in Computer Science and Engineering and currently an Assistant Professor in the Department of Geography at Louisiana State University. He is also the Associate Director for Computing at the NOAA Southern Regional Climate Center, a 24/7 operational Big Data center for environmental informatics and analytics. He is also a founder of Pecan Analytics, a data analytics startup company. His research interests are in Big Data analytics, Data mining and Data Visualization and works on diverse data domains such as Environment, Healthcare, Transportation and Political science.

Amir Abdul-Jabbar, M.D.

Topic: *Clinical Outcomes after Lateral Approach Interbody Fusion: A Systematic Review*

Study Design: Systematic review.

Objective: To evaluate the efficacy of lateral approach lumbar interbody fusion as evaluated by patient reported outcomes measures and clinically relevant complications.

Summary of Background Data: Anterior and posterior approaches to the lumbar spine for arthrodesis offer proven results to treat lumbar spinal pathology but have significant associated comorbidity. The lateral retroperitoneal approach to the lumbar spine has emerged as a useful and effective approach for interbody fusion. Several authors have reported early case series describing clinical outcomes and observed complications for lateral interbody fusion.

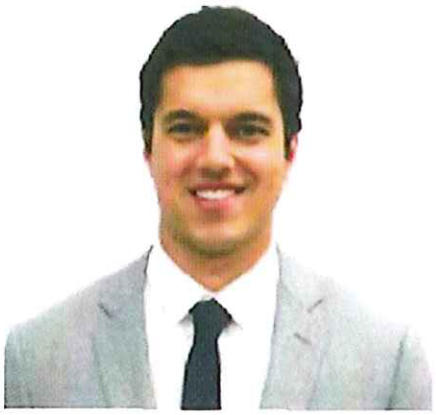
Methods: Using the Medline, Cochran and Pubmed databases, the following search terms were used: "lateral," "lumbar," "interbody," "fusion" and "outcome or outcomes." A total of 278 studies were reviewed for possible inclusion. A minimum of twenty patients and twelve months mean follow up were required for inclusion. Final analysis yielded 11 studies meeting inclusion criteria for complete review.

Results: All studies showed statistically significant improvement in outcomes measures compared to preoperative values which were sustained throughout the follow up period. Oswestry Disability

Index (ODI) and Visual Analog Scale (VAS) were consistently reported through all studies. Mean ODI improvement was 23.5 points. The most commonly reported complication was ipsilateral thigh paresthesia which showed incidences from 3.5 to 25.9%. The compiled cumulative incidence of persistent quadriceps weakness at final follow up was 0.98%.

Conclusions: Preliminary reports on lateral approach interbody fusion show clinically significant improvement in patient reported outcomes and relatively low rates of serious surgical complications. Preoperative risk discussions should include discussion of possible femoral nerve irritation or injury.

Bryce A. Fugarino, M.D.



Topic: *Single-Use Sets for Volar Distal Radius Plating are Currently Less Cost Effective than Conventional Sets*

Bryce Fugarino, MD, M. Patricia Fox, MD, Cristina Terhoeve, BA, Nicholas Pappas, MD

ABSTRACT

Hypothesis
Volar plating of distal radius fractures is an increasingly common procedure. Pre-sterilized, single-use volar plate fixation sets have been purported to increase operating room efficiency and decrease cost. The purpose of this study was to compare the actual cost of using a conventional set versus the projected cost of using its single-use counterpart. We believe that single-use sets have the potential advantage to streamline peri-operative procedures and hypothesized that use of these sets is more cost effective than conventional sets.

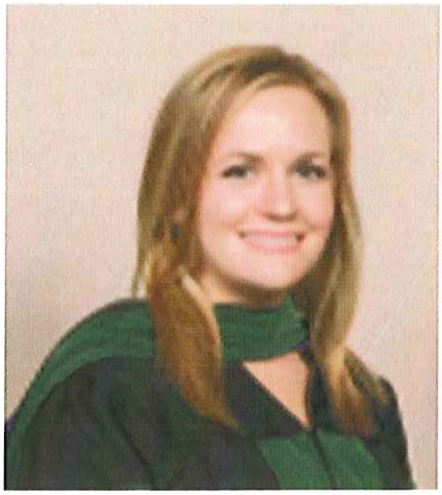
Methods
We retrospectively analyzed 30 consecutive cases of volar plate fixation in which conventional instruments sets were used. The actual cost of using the conventional set (including instrument processing fees) versus the projected cost of using the single-use set was calculated. Student's t-test was used for statistical analysis with statistical significance set at $p < 0.05$.

Results
The mean total cost per case for the conventional set was $2,728. The sticker price for the single-use set is $2,650, which corresponds to an initial $78 cost savings. However, additional hardware was needed to supplement the single-use sets in 23 of the 30 (77%) cases. The mean cost of hardware supplementation was $282 per case. When additional hardware was included in total cost of utilizing single-use sets, the mean cost rose to $2,868, resulting in a $140 increase in cost compared to conventional sets ($p < 0.05$, Figure 1). In all cases requiring additional hardware, appropriate length screws were unavailable and thus necessitated the use of individually sterilized/wrapped screws. The most commonly needed supplemental screws were 18 mm locking screws followed by multi-directional screws (Table 1).

Summary Points

- As the health care agenda continues to strive for cost effectiveness, the implementation of single-use systems have begun to emerge as a means to improve operative efficiency.
- Even though a number of investigators have quantified the health care burden of distal radius fractures, implant cost in conventional versus the single-use volar plating systems for distal radius fracture management has not been studied.
- We identified that implant cost of the single-use system for volar plating of distal radius fractures of a single company is currently a less cost effective alternative to their conventional sets.
- While the sticker price of the single-use set is less than the mean charge for using a conventional set, additional screws not available in the single-use set were required in 77% of cases and consequently rendered the conventional set cheaper in 83.3% of cases.

Lindsey G. Liuzza, M.D.



Topic: *Database Analysis of Early Complications and Costs Associated With Operative and Nonoperative Treatment of Proximal Humerus Fractures in Privately Insured Patients*

Background: Despite lack of consensus regarding the benefits of operative treatment, trends suggest that the rate of operative treatment continues to grow. There is an absence of studies in the literature comparing complications and the cost of proximal humerus fracture treatment in the privately insured population. The purpose of this study is to compare the cost between non-operative management, arthroplasty and open reduction and internal fixation.

Methods: A retrospective analysis of patients with proximal humerus fractures treated in 2009 was performed using the MarketScan® database. The Marketscan® database contains data on 174 million commercially insured patients under the age of 65. Patient demographics, 30-day costs, inpatient costs, and likelihood of 30-day ER visit or readmission were compared between treatment groups.

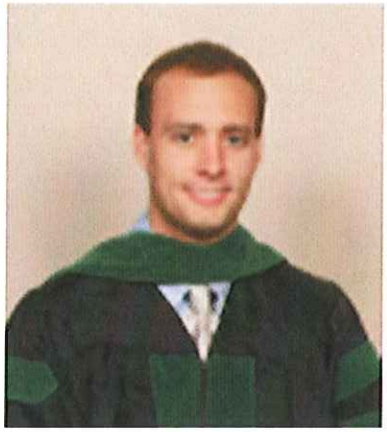
Results: 9,493 patients with proximal humerus fractures were identified and met inclusion criteria. Of these patients, 86.23% (8,186) were managed with non-operative treatment, 11.56% (1,097) with ORIF and 2.21% (210) with arthroplasty. Patients treated with arthroplasty were older and more likely to be female. The Charlson Comorbidity Index (CCI) was highest in the arthroplasty group (1.44) followed by the ORIF group (0.85) and lowest in the non-operative group (0.79). 30-day cost was highest in the surgical treatment groups with ORIF costing an additional $13,665.80 and arthroplasty costing an additional $20,535.69 in comparison to the non-operative treatment. Patients treated with ORIF were more likely to have ER visits than non-operative patients. Among patients with an initial hospital admission, those treated with arthroplasty were less likely to be re-admitted than the patients treated non-operatively. There was no significant difference in readmission between ORIF and arthroplasty groups. Female sex was associated with lower inpatient cost by $5,534.59 compared to male patients. Higher Charlson Comorbidity Index (CCI) was

associated with higher likelihood of ER visits in 30 days, higher likelihood of readmission, higher inpatient costs, and higher 30-day costs.

Conclusion: While surgical treatment of proximal humerus fractures was not associated with early complications and re-admission, it was associated with a significant increase in cost. Absent an increase in short term complications; the shift toward operative treatment may continue further increasing costs.

Level of Evidence: Level III

Harry J. Molligan, IV., M.D.



Topic: *Evaluation of Incidences of Heterotopic Ossification within the LSU Hospital System*

Harry J. Molligan IV, MD, Matt Fury, MS, Mitch John, MS, Stuart Schexnayder, MS, Vinod Dasa, MD.

Background:

As emergency management of battlefield injuries has become more effective, there has been an increase in rate of survival from high energy missile and blast injuries. As a result, there has been a rise in the number of patients with severely traumatized extremities surviving their injuries. A frequently seen complication of such injuries is the development of ectopic bone formation within the traumatized tissue, or Heterotopic Ossification (HO). The process of heterotopic bone formation is poorly understood. A few common inciting events have been noted. An initial traumatic event occurs, followed by an inflammatory signaling cascade leading to infiltration of local tissues with progenitor cells. Bone is then formed within non-osseous tissues. This study seeks to report an incidence of HO bone formation within a civilian trauma population, and to investigate the correlation between demographic data as well as commonly measured laboratory values and the development of HO after traumatic injury in this civilian cohort.

Methods:

A retrospective review of patients identified as having a diagnosis of HO from an ICD-9 chart query was performed. The query included all patients from April 2008 to March 2013 within the LSU Healthcare Network. Patients were included if they were identified with ICD-9 codes specific to heterotopic ossification or myositis ossificans (728.11, 728.12, 728.13). Patients were also included if they were identified with non-specific musculoskeletal codes (728.10, 728.19, 733.99) in order to capture patients with HO who may have been imprecisely coded. We identified patients with a specific diagnosis code for HO and with non-specific codes. These patient carts were then individually reviewed, which included inspection of imaging studies and clinical notes to confirm the diagnosis of HO.

Statistical Analysis

A retrospective matched case-control study was conducted where HO cases were matched with non HO case on a 1:4 ratio (Ury, 1975). Controls were matched on injury, age, gender and race of the cases. Two cases did not match because their race was not reported. A total of 179 controls were

matched with 48 cases as 1 case had 3 matching controls and 2 cases had the same gender, race and age and therefore matched with the same controls.

Data was analyzed using the SAS/STAT software version 9.2 (SAS Institute Inc., Cary, NC, USA). Univariate and multivariate conditional logistic regressions were used to calculate odds ratios (ORs) and 95% confidence intervals (CIs) of having HO as a function of body mass index, glucose, white blood cell count, and platelets.

Results:

Forty-eight patients with HO were identified over 5 year period, 33(68.8%) male and 15 (31.2%) female with a mean age of 45.2 (SD: 13.5) years. Measured lab data is as follows, Mean (SD): WBC 8.0 (3.4), BMI 29.4 (7.9), Platelet 285.6 (121.0), and Glucose 104.6 (28.1). Univariate analysis revealed Odds Ratios of: WBC 0.939 (p= 0.2870), BMI 1.019 (p= 0.4562), Platelet 1.004 (p= 0.0436), and Glucose 0.994 (p= 0.2071). There were no statistically significant findings upon multivariate analysis.

Conclusion:

The incidence of Heterotopic Ossification due to trauma within the LSU system over a 5 year period was 48 confirmed cases. Significant limitations in data collection from database were encountered and likely influence number of patients identified as well as analysis of confirmed cases. There was noted to be a statistically significant finding upon univariate analysis of Platelets; Odds Ratio= 1.004 (p= 0.0436), however the clinical significance of this remains to be determined. These results may warrant further study focused on acute phase reactants, with more complete data available with the current widespread use of modern EMR systems and larger sample size. Potential preventative therapies may be focused on modulating severe inflammatory response.

Pouya Alijanipour, M.D.

Topic: *Radiographic Comparison of Patient-Specific (PS) and Manually Contoured Conventional (C) Rods in Adolescent Idiopathic Scoliosis (AIS) Surgery*

Pouya Alijanipour, MD; Michael J. Heffernan MD; Nicholas K. Baldwin BS; Andrew G. King MD
Orthopedic Pediatric Spine Surgery, Children's Hospital of New Orleans, Louisiana State University Health Sciences Center, New Orleans, USA

Summary
We retrospectively studied 41 consecutive AIS patients of an experienced surgeon with either PS rods (digitally-planned prefabricated) or C rods (manually contoured during surgery). Change of rod contour was comparable in both groups at 1-year follow-up but spinal thoracolumbar (TL) junction angle was significantly more lordotic in C group.

Hypothesis
PS rods are associated with more physiologic sagittal alignment and less rod contour change when compared to C rods.

Design
Retrospective single-surgeon study of consecutive patients before and after use of PS rods

Introduction
In AIS surgery, it is unclear if prefabricated PS rods (based on digital planning using preoperative x-rays) are associated with an alignment advantage compared to manually contoured C rods.

Methods
Operative AIS cases with either PS rods (n=21) or manually contoured C rods (n=20) and 1-year follow-up were included. Calibrated digital pre and postoperative x-rays were assessed for spinal alignment and rod contour change (Δ: 1year-immediate postoperative x-rays for maximal rod deflection distance [MRDD] and angle of tangents to rod endpoints [AT]) using t-tests.

Results

There was no significant difference between PS and C groups in terms of age (mean: 15 vs 14.8 years), female gender (76 vs 85%), body mass index (21.7 vs 21.4 kg/m^2), Cobb angle (57.1 vs 54.8°), pelvic incidence (49.5 vs 50.0°), sagittal parameters, surgery duration (201 vs 206 minutes), number of fused levels (10.2 vs 9.4), rod material (Titanium alloy rods: 81 vs 65%), rod diameter (6.0 vs 5.8 mm) and surgical complications (1 wound dehiscence vs none), respectively (all p values > 0.05). Postoperative x-rays showed no statistically significant difference in Cobb angles (13.7 vs 13.6°), thoracic kyphosis (27.1 vs 24.4°), lumbar lordosis (55.8 vs 57.6°) and rod contour change (ΔMRDD: 1.1 vs 1.4 mm; ΔAT: 1.8 vs 3.1°), respectively (all p values > 0.05). In patients with thoraco-lumbar (TL) fusion (n=13 in each group), postoperative TL angle (T10-L2) was significantly lordotic in C group (-7.3°) compared to PS group (-0.3°, $p<0.001$).

Conclusion

In this study PS and C rods were generally associated with comparable sagittal spinal alignment and rod contour change 1 year after AIS surgery. The only exception was spinal TL junction, which was hyperlordotic in C group due to suboptimal positioning of thoracic and lumbar curves during manual rod contouring.

Department of Orthopaedic Surgery

Residents, Faculty, & Staff

RESIDENTS

2017 Graduates
Amir Abdul-Jabbar, MD
Bryce Fugarino, MD
Lindsey Liuzza, MD
Harry Molligan, MD

PGY-4s
Matthew Delarosa, MD
Mary "Patricia" Fox, MD
Rabun Fox, MD
Thomas Royals, MD

PGY-3s
Thomas Lucak, MD
Jack McKay, MD
Neuyen McLean, MD
Vikas Patel, MD

PGY-2s
Kirk Jeffers, MD
Samuel Klatman, MD
Daniel Plessl, MD
William "Luke" Shelton, MD

PGY-1s
Ryan Dewitz, MD
Sagar Shah, MD
Thomas Stang, DO
Tyler White, MD

Incoming Residents
Peter D'Amore, MD
Ryan Roubion, MD
Cristina Terhoeve, MD
Corinne Young, MD

FACULTY

William Accousti, MD – Associate Professor – *Pediatric Spine* / Children's Hospital of N.O.

Larry "Chip" Bankston, MD – Clinical Assistant Professor – *Sports Medicine* / Baton Rouge, LA

Alex Betech, MD – Assistant Professor / Baton Rouge, LA

Matthew Cable, MD – Assistant Professor – *Oncology*

Vinod Dasa, MD – Associate Professor & Director of Research - *Adult Reconstruction*

Henry Eiserloh, MD – Clinical Assistant Professor – *Adult Spine* / Baton Rouge, LA

Dominic Gargiulo, DO – Assistant Professor – *Pediatric Spine* / Children's Hospital of N.O.

Michael Hartman, MD – Associate Professor & Program Director – *Sports Medicine*

Michael Heffernan, MD – Assistant Professor – *Pediatric Spine* / Children's Hospital of N.O.

Andrew King, MD – Professor – *Pediatric Spine* / Children's Hospital of N.O.

Peter Krause, MD – Associate Professor – *Trauma*

Abhishek Kumar, MD – Assistant Professor – *Adult Spine*

Monroe J. Laborde, MD – Clinical Assistant Professor – *Foot & Ankle*

James Lalonde, MD – Clinical Assistant Professor – *Foot & Ankle* / Baton Rouge, LA

Olivia Lee, MD – Assistant Professor - *Trauma*

Claudia Leonardi, Ph.D. – Assistant Professor of Research – *Statistician*

Mandy Lopez, Ph.D. – Assistant Professor of Research – *Statistician*

Christopher Marrero, MD – Associate Professor – *General*

Ronnie Mathews, MD – Clinical Assistant Professor / Baton Rouge, LA

Arthur Mora, Ph.D. – Assistant Professor of Research

Nicholas Pappas, MD – Clinical Assistant Professor – *Hand/Upper Extremity*

Michael Schutte, MD – Clinical Assistant Professor / Lafayette, LA

John Thomas, MD – Clinical Assistant Professor / Baton Rouge, LA

Robert Zura, MD – Department Head & Chairman - *Trauma*

STAFF

Shawn Bosby
Department Coordinator

Linda Flot
Residency Coordinator

Linus Igbokwe
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Edwina Jackson
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Cara Rowe
Research Coordinator

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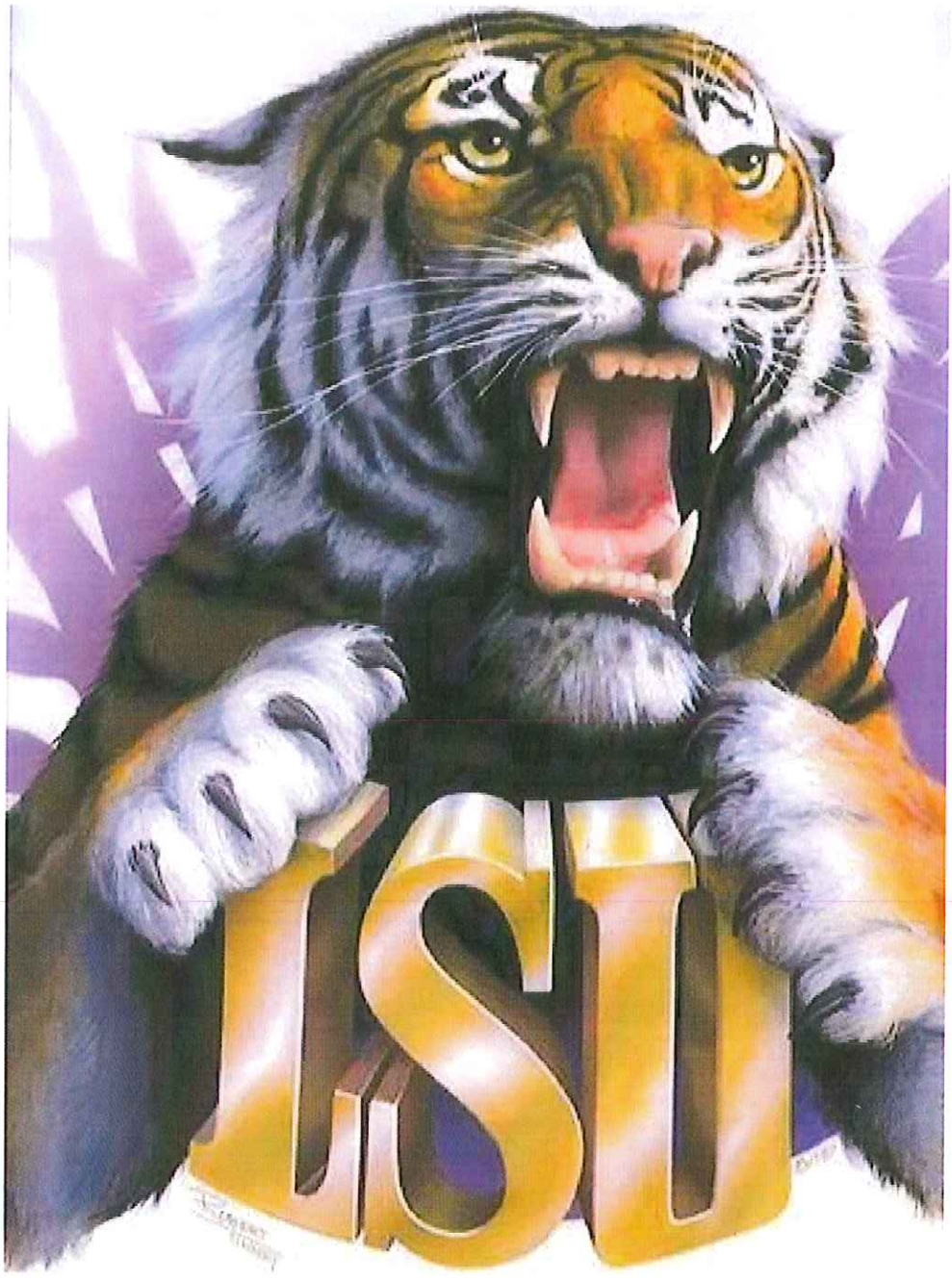
To Our

2017 Graduates!



Drs. Abdul-Jabbar, Alijanipour, Fugarino, Liuzza, & Molligan