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OREF WESTERN REGION
RESIDENT RESEARCH SYMPOSIUM
Wednesday, October 4, 2023

University of California, San Diego
Resident Research Symposium
The Alexandria at Torrey Pines
10996 Torreyana Road
San Diego, California

Hosted by:
Susan V. Bukata, MD, FAOA, FAAOS
Professor and Chair
Department of Orthopaedic Surgery
University of California, San Diego

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About OREF

The Orthopaedic Research and Education Foundation (OREF) is a charitable 501(c)(3) organization committed to improving lives by supporting excellence in orthopaedic research through its grant funding and research education programs. As an independent nonprofit, OREF strives to improve clinical care and patient outcomes by advancing innovative research, developing new investigators, and uniting the orthopaedic community in promoting musculoskeletal health. Visit oref.org or follow OREF on Twitter (@OREFtoday).

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**OREF WESTERN REGION RESIDENT RESEARCH SYMPOSIUM
SUMMARY AGENDA**

Wednesday, October 4, 2023

- 7:00 a.m. – 8:00 a.m. **Registration and Breakfast**
The Alexandria at Torrey Pines
10996 Torreyana Road
San Diego, CA
- 8:00 a.m. 8:05 a.m. **Welcome and Introductions**
Susan V. Bukata, MD, FAOA, FAAOS
Professor and Chair
Department of Orthopaedic Surgery
University of California, San Diego
- 8:05 a.m. – 8:10 a.m. **Opening Remarks**
D.C. Covey, MD, MSc, FAOA
CME Course Director
Department of Orthopaedic Surgery
University of California, San Diego
- 8:10 a.m. – 8:15 a.m. **OREF Welcome**
Mr. Lee Grossman
Chief Executive Officer
Orthopaedic Research and Education Foundation
- 8:20 a.m. – 8:55 a.m. **Session I – Resident Research Presentations & Discussion**
- 8:55 a.m. – 9:30 a.m. **Session II – Resident Research Presentations & Discussion**

Break – Please submit your scores from Sessions I and II to OREF Staff
- 9:40 a.m. – 10:20 a.m. **Session III – Resident Research Presentation & Discussion**
- 10:20 a.m. – 11:00 a.m. **Session IV – Resident Research Presentations and Discussion**

Break – Please submit your scores from Sessions III and IV to OREF Staff
- 11:10 a.m.- 11:12 a.m. **Keynote Speaker Introduction**
- 11:12 a.m.–11:57 a.m. **Keynote Address**
**“How to Get Your Manuscript Published and Why Participate
in the Peer Review Process”**
Marc F. Swiontkowski, MD
Professor Department of Orthopaedic Surgery
University of Minnesota
- 11:57 a.m. – Noon **Awards Presentation and Closing Remarks**
Thank you to all sponsors!
Closing of program to OREF TV audience
- Noon – 1:00 p.m. **Lunch**

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KEYNOTE SPEAKER



Marc F. Swiontkowski, MD

**Professor Department of Orthopaedic Surgery
University of Minnesota**

Marc Swiontkowski, MD, is Board Certified by the American Board of Orthopaedic Surgery. He is the past president of the Orthopaedic Trauma Association and the American Orthopaedic Association.

In 1979, he received his Medical Degree from the University of Southern California School of Medicine. He completed his internship and residency training at the University of Washington. After a research fellowship in Switzerland, he joined the faculty at Vanderbilt University. In July 1988 he returned to the University of Washington and in 1989, was promoted to Professor of Orthopaedic Surgery and assumed the position of Chief of Orthopaedic Surgery, Harborview Medical Center, Seattle, Washington. From September 1997 through October 2007, he held the position of Professor and Chairman of the Department of Orthopaedic Surgery at the University of Minnesota. From 2007 through July 2015, he held the position of CEO for TRIA Orthopaedic Center. He is currently a Professor at the University of Minnesota.

Dr. Swiontkowski is an NIH funded investigator and has published articles in peer review journals on numerous topics including osteomyelitis, fracture treatment, and the assessment of musculoskeletal outcomes. He has lectured extensively in this country as well as abroad. He is currently the Editor-in-Chief for The Journal of Bone and Joint Surgery.

Judges and Moderators

Visiting Professor

Marc F. Swiontkowski, MD
University of Minnesota Medical School

Judges/Moderators

Michael J. Botte, MD
VA Medical Center and Scripps Health, San Diego

Matthew J. Meunier, MD
University of California, San Diego

Catherine M. Robertson, MD
University of California, San Diego

Samuel R. Ward, PT, PhD
University of California, San Diego

OREF Western Region Resident Research Symposium
DETAILED AGENDA
Wednesday, October 4, 2023

8:00 a.m. – 8:05 a.m.	Welcome and Introductions Susan V. Bukata, MD, FAOA, FAAOS Professor and Chair Department of Orthopaedic Surgery University of California, San Diego
8:05 a.m. – 8:10 a.m.	Opening Remarks D.C. Covey, MD, MSc, FAOA CME Course Director Department of Orthopaedic Surgery University of California, San Diego
8:10 a.m. – 8:15 a.m.	OREF Welcome Mr. Lee Grossman Chief Executive Officer Orthopaedic Research and Education Foundation
	Session I – Resident Research Presentations & Discussion Moderator: Catherine M. Robertson, MD
8:20 a.m. – 8:25 a.m.	<i>Restoration of Hip Kinematics One Year After Hip Arthroscopy for Femoroacetabular Impingement Syndrome</i> Edgar Garcia-Lopez, MD, University of California, San Francisco
8:25 a.m. – 8:30 a.m.	<i>Hormonal Contraceptives Protect Against Ligament Injuries in Female Athletes</i> Christian Blough, MD, Cedars-Sinai
8:30 a.m. – 8:35 a.m.	<i>A Systematic Review of Trainee Ethnic and Gender Diversity in Orthopaedic Surgery and Other Surgical Subspecialties</i> Rishi Trikha, MD, University of California, Los Angeles
8:35 a.m. – 8:40 a.m.	<i>Low Early Complication Rates After Arthroscopic Meniscus Repair and Meniscectomy</i> Tyler Mange, MD, University of California, Irvine
8:40 a.m. – 8:45 a.m.	<i>Bisphosphonate Chaperones Effectively Target the Enthesis Without Impairing Soft Tissue-to-Bone Repair Integrity</i> Brendan Shi, MD, University of California, Los Angeles
8:45 a.m. – 8:55 a.m.	Question and Answer

OREF Western Region Resident Research Symposium
DETAILED AGENDA (Continued)
Wednesday, October 4, 2023

Session II – Resident Research Presentations & Discussion

Moderator: Michael J. Botte, MD

- | | |
|-----------------------|---|
| 8:55 a.m. – 9:00 a.m. | <i>Prediction of Unplanned Readmission or Prolonged Admission After Outpatient Cervical Disc Replacement</i>
Akash Shah, MD – University of California, Los Angeles |
| 9:00 a.m. – 9:05 a.m. | <i>Early Post-Operative Improvement in Biomechanical Function Following Total Hip Arthroplasty is Predicted by Muscle Quality Adjacent to the Affected Joint</i>
Ryan Halvorson, MD, University of California, San Francisco |
| 9:05 a.m. – 9:10 a.m. | <i>Distinct Human Stem Cell Subpopulations Drive Adipogenesis and Fibrosis in Musculoskeletal Injury</i>
Steven M. Garcia, MD, University of California, San Francisco |
| 9:10 a.m. – 9:15 a.m. | <i>A Comparison of Outcomes in Ankle Syndesmosis Injuries Treated with an Aperture Fixation Device, Suture Button, and Syndesmotic Screw</i>
Garrett Berger, MD, PharmD, University of California, San Diego |
| 9:15 a.m. – 9:20 a.m. | <i>Patient-Specific Alignment Utilizing Handheld Computer Assisted Navigation for Total Knee Arthroplasty</i>
Cooper Ehlers, MD, University of California, San Diego |
| 9:20 a.m. – 9:30 a.m. | Question and Answer |
| 9:30 a.m. – 9:40 a.m. | Break |

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OREF Western Region Resident Research Symposium
DETAILED AGENDA (Continued)
Wednesday, October 4, 2023

Session III – Resident Research Presentation & Discussion

Moderator: Samuel R. Ward, PT, PhD

- 9:40 a.m. – 9:45 a.m. *Association Between Same-Day Discharge Shoulder Arthroplasty and Risk of Adverse Events in Patients with American Society of Anesthesiologists Classification ≥ 3 : A Cohort Study*
Michael Hachadorian, MD, University of California, San Diego
- 9:45 a.m. -9:50 a.m. *Danger Zone in Anterolateral Plate Fixation of the Distal Tibia – A 3D CT Angiography Model*
Brendon Mitchell, MD, University of California, San Diego
- 9:50 a.m. – 9:55 a.m. *Combined Locking Attachment Washer (LAW) with Retrograde Intramedullary Nail for the Treatment of Distal Femoral Fractures*
Brendan O'Leary, MD, University of California, San Diego
- 9:55 a.m. – 10:00 a.m. *Pediatric Cervical Spine Injury Patterns and Management Strategies: A Retrospective 10-Year Evaluation at a Level 1 Pediatric Trauma Center*
Karch M. Smith, MD, University of California, San Diego
- 10:00 a.m.–10:05 a.m. *The Effect of Adjacent Level Osteophytes on Proximal Junctional Kyphosis After Multi-Level Thoracolumbar Fusions*
Samy Gabriel, MD, University of California, San Diego
- 10:05 a.m.–10:10 a.m. *Stepwise Ponte Osteotomy: Biomechanical Pilot of a Risk-Minimizing Approach*
Ian Hollyer, MD, Stanford University
- 10:10 a.m.–10:20 a.m. **Question and Answers**

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OREF Western Region Resident Research Symposium
DETAILED AGENDA (Continued)
Wednesday, October 4, 2023

Session IV – Resident Research Presentations & Discussion

Moderator: Matthew Meunier, MD

- 10:20 a.m.–10:25 a.m. *Public Insurance is Associated with a Longer Time to Surgery for Distal Radius Fractures*
Angel Xiao, MD, University of California, San Francisco
- 10:25 a.m.–10:30 a.m. *Cervical Spine Conditions in United States Military Aviators: A 19-Year Retrospective Cohort*
Richard W. Lang III, MD, Naval Medical Center San Diego
- 10:30 a.m.–10:35 a.m. *Intermediate Outcomes of Medical Ulnar Collateral Ligament Reconstruction Using Gracilis Allograft in Adolescent Patients*
Leonie Campbell, MD, Naval Medical Center San Diego
- 10:35 a.m.–10:40 a.m. *Midterm Postoperative Patient Satisfaction Scores After Coracoclavicular Ligament Reconstruction in Active-Duty Military Service Members*
Kieran Wolf, MD, Naval Medical Center San Diego
- 10:40 a.m.–10:45 a.m. *A Comparison of Prognostic Models to Facilitate Surgical Decision-Making for Patients with Spinal Metastatic Disease*
Wyatt VanderVoort, MD, University of California, Davis
- 10:45a a.m.–10:50 a.m. *Sociodemographic Characteristics of Patients Undergoing Surgery for Metastatic Disease of the Spine*
Gregory Harbison, MD, University of California, Davis
- 10:50 a.m.–11:00 a.m. **Question and Answers**
- 11:00 a.m.–11:10 a.m. **Break**
- 11:10 a.m.– 11:12 a.m. **Introduction of Keynote Speaker**
- 11:12 a.m.–11:57 a.m. **Keynote Address**
“How to Get Your Manuscript Published and Why Participate in the Peer Review Process”
Marc F. Swiontkowski, MD
Professor, Department of Orthopaedic Surgery
University of Minnesota
- 11:57 a.m. - Noon **Awards Presentation and Closing Remarks**
- Noon – 1:00 p.m. **Lunch**

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Restoration of Hip Kinematics One Year after Hip Arthroscopy for Femoroacetabular Impingement Syndrome

Edgar Garcia-Lopez, MD
University of California, San Francisco

Purpose/Significance: This study aimed to assess the impact of hip arthroscopy on biomechanical function in patients with femoroacetabular impingement syndrome (FAIS) during gait, stair climb and descent. We hypothesized that preoperative differences in hip, knee, and ankle kinematics between symptomatic and contralateral limbs would be corrected one year postoperatively.

Methods: Ten patients (eight females) undergoing hip arthroscopy for FAIS were included. 3D motion tracking was performed using a 10-camera system, and joint kinematics were calculated in the sagittal, coronal, and transverse planes. Peak and valley angles for each joint during each task were compared between limbs using linear mixed effects models.

Results: Preoperatively, significant differences were observed in hip flexion during gait (21.4 vs 17.7 degrees, $p < 0.01$) and stair climb (45.6 vs 39.7 degrees, $p < 0.01$) between the symptomatic and contralateral limbs. No difference was observed in stair descent. One year postoperatively, significant improvements were seen in hip flexion during gait (22.3 vs 25.8 degrees, $p < 0.01$) and stair climb (37.1 vs 43.7 degrees, $p < 0.01$) in the symptomatic hip compared to the contralateral limb. Small between-limb differences in angles for other joints were also observed.

Conclusion: These findings indicate that hip arthroscopy for FAIS restores hip flexion during dynamic tasks such as gait and stair climbing. Tasks requiring less hip flexion, like stair descent, are not affected. Limited knee flexion may be a compensation mechanism or a result of hip pain. Additionally, small changes in ankle motion suggest that hip kinematics may influence motion at other joints. Hip arthroscopy improves hip flexion during dynamic tasks one year postoperatively.

Figure 1

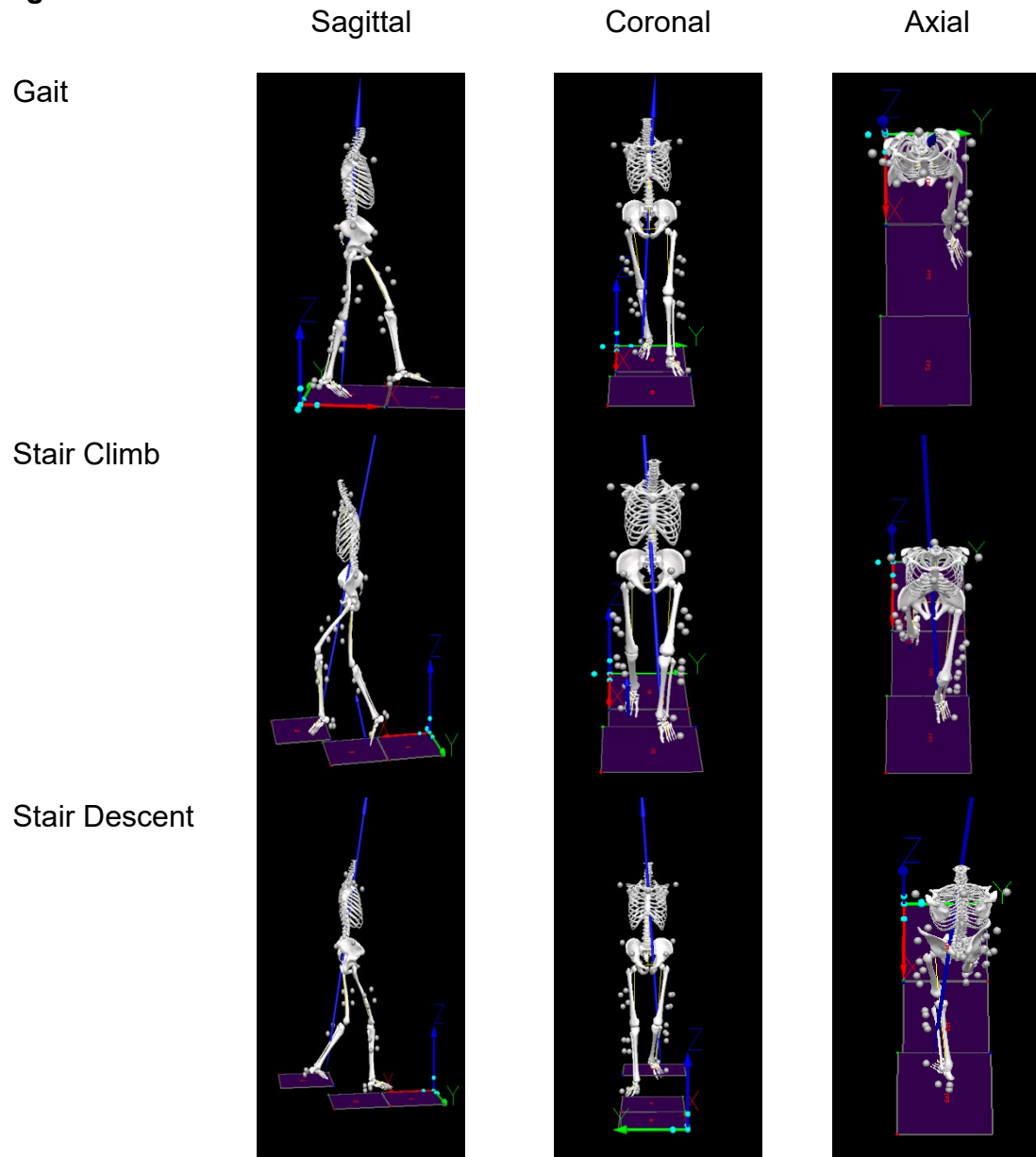


Table 1: Comparison of joint kinematics during gait between surgical and non-surgical side pre-operatively and 1 year post op.

		Pre-operative			1-year Post-operative		
		Control Side	Operative Side	p-value	Control Side	Operative Side	p-value
		Mean (SD)	Mean (SD)		Mean (SD)	Mean (SD)	
Hip							
	Flexion	21.4 (8.4)	17.8 (10.3)	<0.001	22.3 (9.3)	25.8 (5.5)	<0.001
	Extension	-14.1 (7.8)	-15.1 (6.8)	0.2	-14.1 (7.8)	-15.1 (6.8)	0.2
	Adduction	7.5 (1.7)	7.2 (2.6)	0.3	6.2 (2.6)	6.2 (2.4)	0.9
	Abduction	-2.4 (2.9)	-3.9 (2.8)	<0.001	-2.4 (2.9)	-3.9 (2.8)	<0.001
	IR	3.9 (5.8)	5.7 (6.1)	0.09	5.4 (5.8)	4.0 (5.8)	0.04
	ER	-6.7 (5.3)	-8.63 (4.3)	0.001	-6.7 (5.3)	-8.6 (4.3)	0.01
	Hip Power scalar	1.2 (0.38)	4.3 (9.3)	0.002	0.93 (0.43)	1.1 (0.39)	0.002
Knee							
	Flexion	42.9 (8.3)	40.5 (9.1)	0.03	40.9 (12.8)	41.8 (9.5)	0.5
	Extension	-1.4 (5.0)	0.7 (4.0)	<0.001	-1.4 (5.0)	0.65 (4.0)	<0.001
	Adduction	1.5 (4.3)	2.4 (3.2)	0.1	3.5 (2.7)	2.6 (2.3)	<0.001
	Abduction	-2.7 (2.1)	-2.5 (2.5)	0.6	-2.7 (2.1)	-2.5 (2.5)	0.6
	IR	-2.3 (7.8)	-3.2 (4.7)	0.4	0.55 (5.3)	-2.9 (3.9)	<0.001
	ER	-12.4 (7.1)	-14.3 (5.7)	0.001	-12.4 (7.1)	-14.3 (5.7)	0.001
Ankle							
	Flexion	14.0 (4.3)	13.2 (4.0)	0.03	14.2 (2.8)	13.8 (3.9)	0.2
	Extension	-11.7 (5.1)	-12.1 (5.0)	0.5	-11.7 (5.1)	-12.1 (5.0)	0.5
	Adduction	5.1 (3.4)	6.2 (3.0)	0.005	3.7 (2.3)	6.2 (2.6)	<0.001
	Abduction	-6.0 (2.1)	-5.1 (1.8)	0.001	-6.0 (2.1)	-5.1 (1.8)	<0.001
	IR	-3.5 (5.4)	-6.2 (6.2)	0.003	-3.2 (5.8)	-3.9 (5.0)	0.2
	ER	-16.0 (5.7)	-16.1 (2.7)	0.9	-16.0 (5.7)	-16.1 (2.7)	0.9

Table 2: Comparison of joint kinematics during stair climb between surgical and non-surgical side pre-operatively and 1 year post op.

		Pre-operative			1-year Post-operative		
		Control Side	Operative Side	p-value	Control Side	Operative Side	p-value
		Mean (SD)	Mean (SD)		Mean (SD)	Mean (SD)	
Hip							
	Flexion	45.6 (8.9)	39.7 (13.3)	>0.001	37.1 (16.4)	43.7 (10.2)	0.002
	Extension	1.7 (7.9)	-0.70 (9.4)	0.02	-2.4 (7.6)	0.21 (9.5)	0.03
	Adduction	5.6 (3.2)	5.7 (3.9)	0.9	4.2 (2.5)	5.04 (1.9)	0.01
	Abduction	-3.8 (2.1)	-3.0 (2.9)	0.06	-3.3 (2.1)	-5.8 (1.82)	<0.001
	IR	1.7 (3.3)	4.4 (5.6)	<0.001	4.87 (5.5)	3.7 (5.1)	0.057
	ER	-8.7 (2.6)	-6.3 (5.3)	0.0015	-6.22 (5.3)	-8.2 (4.3)	0.0078
	Hip Power scalar	4.4 (6.1)	4.8 (6.4)	0.65	1.49 (0.69)	1.76 (0.86)	0.07
Knee							
	Flexion	46.2 (8.9)	39.1 (14.4)	<0.001	43.3 (9.02)	43.6 (8.9)	0.8
	Extension	8.4 (6.7)	3.7 (5.9)	<0.001	4.96 (5.4)	6.1 (6.5)	0.2
	Adduction	4.2 (3.0)	5.7 (4.7)	0.003	5.1 (4.08)	4.83 (3.6)	0.53
	Abduction	-0.86 (2.6)	-0.47 (2.8)	0.25	-1.23 (2.9)	-0.27 (3.07)	0.011
	IR	0.44 (8.6)	-0.73 (5.2)	0.10	-0.43 (5.42)	-3.03 (4.6)	<0.001
	ER	-9.6 (7.3)	-9.7 (5.3)	0.87	-9.9 (5.9)	-11.0 (4.5)	0.08
Ankle							
	Flexion	10.8 (5.7)	8.8 (4.9)	0.002	9.8 (3.6)	9.1 (4.52)	0.21
	Extension	-14.0 (7.2)	-13.1 (6.0)	0.22	-12.7 (6.0)	-13.0 (5.8)	0.7
	Adduction	4.6 (4.2)	5.5 (4.4)	0.08	4.3 (3.25)	4.6 (3.01)	0.6
	Abduction	-7.3 (4.1)	-7.0 (3.5)	0.52	-7.1 (3.35)	-6.7 (3.4)	0.3
	IR	-3.5 (6.1)	-4.8 (6.4)	0.22	-2.6 (5.6)	-1.8 (3.8)	0.2
	ER	-13.7 (6.9)	-15.8 (4.9)	0.02	-0.57 (0.55)	-0.57 (0.23)	0.97

Table 3: Comparison of joint kinematics during stair descent between surgical and non-surgical side pre-operatively and 1 year post op.

		Pre-operative			1-year Post-operative		
		Control Side Mean (SD)	Operative Side Mean (SD)	p-value	Control Side Mean (SD)	Operative Side Mean (SD)	p-value
Hip							
	Flexion	21.4 (8.4)	13.1 (4.0)	<0.001	22.3 (9.3)	25.7 (5.44)	<0.001
	Extension	-8.1 (12.3)	-8.3 (12.5)	0.01	-10.6 (11.0)	-11.9 (10.4)	0.14
	Adduction	7.5 (1.7)	6.3 (3.1)	0.28	6.2 (2.6)	6.2 (2.3)	0.9
	Abduction	-3.5 (3.1)	-2.8 (2.6)	0.15	-2.8 (2.1)	-5.42 (1.8)	<0.001
	IR	3.9 (5.8)	-6.4 (6.3)	0.1	5.41 (5.8)	4.2 (5.89)	0.045
	ER	-7.2 (4.9)	-6.1 (6.1)	0.95	-7.96 (5.7)	-10.8 (3.5)	<0.001
	Hip Power scalar	1.2 (0.38)	4.2 (9.2)	0.002	0.93 (0.43)	1.1 (0.39)	0.002
Knee							
	Flexion	42.9 (8.3)	40.6 (9.1)	0.03	40.9 (12.8)	41.9 (9.4)	0.53
	Extension	8.6(6.65)	9.4 (6.08)	0.77	5.3 (12.4)	12.5 (8.5)	<0.001
	Adduction	1.49 (4.25)	2.4 (3.2)	0.1	3.5 (2.7)	2.6 (2.2)	<0.001
	Abduction	-2.2 (3.0)	-1.3 (2.7)	0.04	-2.3 (3.2)	-1.1 (2.9)	0.01
	IR	-2.3 (7.8)	-3.21 (4.64)	0.35	0.55 (5.3)	-2.96 (3.8)	<0.001
	ER	-11.5 (8.0)	-11.4 (5.4)	0.6	-9.9 (5.4)	-12.4 (5.4)	<0.001
Ankle							
	Flexion	13.96 (4.3)	13.1 (4.0)	0.024	14.2 (2.8)	13.8 (3.9)	0.21
	Extension	-19.4 (5.6)	-18.7 (5.3)	0.76	-16.0 (5.98)	-13.8 (6.1)	0.02
	Adduction	5.1 (3.4)	6.3 (3.1)	0.004	3.7 (2.3)	6.2 (2.53)	<0.001
	Abduction	-6.7 (4.4)	-4.9 (3.1)	0.002	-5.95 (3.0)	-3.6 (1.6)	<0.001
	IR	-3.5 (5.4)	-6.4 (6.3)	0.003	-3.2 (5.83)	-3.8 (5.0)	0.2
	ER	-16.4 (7.2)	-17.5 (5.04)	0.51	-14.2 (6.7)	-14.8 (3.2)	0.42

Hormonal Contraceptives Protect Against Ligament Injuries in Female Athletes

Christian Blough, MD
Cedars-Sinai

Purpose: The purpose of this study was to investigate the effect of hormonal contraceptives (HC) on ligamentous injuries in female athletes.

Significance: Female athletes are at a 3 to 9 times greater risk of rupturing their anterior cruciate ligament (ACL) compared to similarly trained males playing the same sport. Relaxin receptors have been detected on female but not male ACLs, suggesting the same hormone that loosens the pubic symphysis during parturition may also predispose women to ligament injury via increased joint laxity

Methods: High level female athletes were recruited and divided into two groups based on their HC status (HC vs non-HC). Serum relaxin and progesterone levels, knee laxity via KT-1000, and generalized hypermobility using the Beighton score were evaluated. Ligamentous injuries were continually tracked throughout their season.

Results: Athletes on HC had significantly less ligamentous injuries than non-HC athletes ($p < 0.05$). Serum relaxin levels were significantly greater in athletes not on HC compared to those on HC ($p < 0.05$). Athletes on HC demonstrate greater knee stability compared to non-HC athletes ($p < 0.05$) but there were no differences in general hypermobility between groups.

Conclusion: Data collected thus far suggests a protective relationship between hormonal contraceptives and ligamentous injuries in high level female athletes.

A Systemic Review of Trainee Ethnic and Gender Diversity in Orthopaedic Surgery and Other Surgical Subspecialties

Rishi Trikha, MD

University of California, Los Angeles

Purpose: This study aims to analyze trends in publications that promote diversity amongst surgical trainees in all surgical subspecialties.

Significance: Given the recent increased emphasis on promoting diversity and equity, especially within orthopaedic surgery, it is important to continually track diversification efforts.

Methods: The Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines were used to query articles from four scholastic databases through June 1, 2022. Broad inclusion criteria for both ethnic and gender diversity within various training levels of any surgical specialty were utilized.

Results: Our query resulted in 1429 publications, of which 320 were included for analysis. Articles were related to diversity at the resident (n=241), fellow (n=42) and medical student level (n=37). The highest number of related publications was in orthopaedic surgery (n=73) followed by general surgery (n=56). Two hundred and sixty of 320 (81.3%) articles from all surgical subspecialties and 56/73 (76.7%) articles from orthopaedic literature were published after 2015.

Conclusion: With the recent increase in publications on diversity in surgical training, close attention should be paid to diversity amongst surgical trainees over the coming years. Should gender and ethnic diversity remain stagnant, diversification efforts may need to be restructured to ultimately achieve a diverse surgeon workforce.

Low Early Complication Rates After Arthroscopic Meniscus Repair and Meniscectomy

Tyler Mange, MD
University of California, Irvine

Purpose: To determine and compare 30-day postoperative complication rates following arthroscopic meniscus repair and meniscectomy.

Significance: With modern techniques, meniscus repair is more commonly attempted. Few studies have examined the short-term complication rates of arthroscopic meniscus repair and meniscectomy, particularly in patients over age 40.

Methods: NSQIP database was used to identify patients who underwent arthroscopic meniscus repair or meniscectomy. Rates of pulmonary embolism (PE), venous thromboembolism (VTE), surgical site infection (SSI), reoperation, and readmission within 30 days postoperatively were determined and compared between groups. A subgroup analysis was performed for patients >40.

Results: 6,354 meniscus repairs and 99,372 meniscectomies were identified. Complication rates were <1% for both, with meniscus repair having significantly higher rates of PE (0.2% vs 0.1%), VTE (0.8% vs 0.4%), and readmission (0.9% vs 0.8%). In patients >40, complication rates were <1.3% for both treatment groups. Patients >40 had significantly higher rates of PE (0.38% vs 0.12%), VTE (1.07% vs 0.46%), and readmission (1.2% vs 0.85%).

Conclusion: Arthroscopic meniscus repair and meniscectomy are both low-risk (30-day complication rates <1%), even among patients over 40 (<1.3%). These findings support meniscus repair when not otherwise contraindicated, even in older patients, and can aid surgeons in preoperative counseling of patients considering arthroscopic meniscus treatment.

Bisphosphonate Chaperones Effectively Target the Enthesis Without Impairing Soft Tissue-to-Bone Repair Integrity

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Purpose: We hypothesized that Osteoadsorbative Fluorogenic Sentinel-3, a novel compound utilizing a bisphosphonate targeting and cathepsin K-dependent release mechanism would localize to the site of tendon-bone repair without affecting the integrity of tendon-bone repairs.

Significance: While growth factors have been shown to improve enthesis organization, there remains a lack of appropriate delivery strategies.

Methods: Achilles tendon-to-bone repair or sham surgery was performed on 12-week-old mice. Animals undergoing repair were divided into 3 groups: (1) repair with local OFS-3 administration, 2) repair with systemic OFS-3 administration, and (3) repair without OFS-3. Serial in vivo fluorescent imaging was used to localize the biodistribution of OFS-3. Repaired hindlimbs were harvested at 6 weeks after surgery and evaluated biomechanically and histologically.

Results: Animals that received either local or systemic OFS-3 after Achilles repair demonstrated higher repair site epifluorescence than those in the sham surgery cohort at all time points ($p < 0.001$). There was no difference in failure load between repaired hindlimbs that received OFS-3 versus saline. There was no difference in tissue size or collagen organization between animals that received OFS-3 versus saline.

Conclusion: OFS-3 successfully targeted the site of Achilles tendon-to-bone repair without affecting the biomechanical properties or histologic appearance of the repair.

Prediction of Unplanned Readmission or Prolonged Admission After Outpatient Cervical Disc Replacement

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Purpose: To develop an algorithm for prediction of prolonged admission or unplanned short-term readmission after outpatient cervical disc replacement (CDR).

Significance: CDR is increasingly performed in the outpatient setting. Prolonged admission or unplanned readmission are associated with increased cost and morbidity.

Methods: We queried the ACS-NSQIP dataset for patients who underwent outpatient CDR between 2012-2020. The primary outcome was admission >1 night or readmission ≤ 3 days after outpatient CDR. We built logistic regression and machine learning (ML) models, assessing discrimination and calibration.

Results: Of the 2,033 patients included, 117 patients required admission >1 night and 8 required readmission ≤ 3 days. The random forest model was the best-performing model (AUROC: 0.707) and was well-calibrated (slope: 1.135, intercept: -0.011). Predictive features include female sex, American Society of Anesthesiology classification, non-white race, diabetes mellitus, hypertension, body mass index, number of levels.

Conclusion: We report a well-calibrated random forest algorithm for prediction of prolonged admission or unplanned short-term readmission after outpatient CDR. Accurate prediction of which patients may require prolonged admission or short-term readmission may aid with appropriate patient selection for outpatient versus inpatient surgery. Modifiable risk factors such as obesity, diabetes, and hypertension may be optimized prior to outpatient CDR to reduce the likelihood of these adverse outcomes.

Early Post-Operative Improvement in Biomechanical Function Following Total Hip Arthroplasty is Predicted by Muscle Quality Adjacent to the Affected Joint

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Purpose: To determine the relationships between preoperative muscle quality and joint degeneration with postoperative patient reported outcomes and objective biomechanical function.

Significance: Identifying pre-operative predictors for post-operative biomechanical recovery would inform patient-specific care plans for optimizing long-term functional outcomes.

Methods: We quantified pre-operative hip muscle quality and joint degeneration using advanced MRI sequences (fat fraction [FF] and Scoring Hip Osteoarthritis with MRI Scores [SHOMRI]) and assessed their relationships with patient-specific changes in kinematic movement quality and patient reported outcomes at 6-weeks following THA.

Results: Ten patients were recruited from our institution. At six weeks, greater biomechanical improvement was strongly correlated with lower minimus FF ($\rho=0.63$), moderately correlated with medius FF ($\rho=0.59$), and weakly correlated with TFL FF ($\rho=0.26$) and SHOMRI ($\rho=0.39$). Symptomatic improvement (HOOS) was also correlated with medius ($\rho=.39$), minimus ($\rho=.32$), and TFL ($\rho=.20$) FF.

Conclusion: These findings suggest adjacent muscle quality may be a key predictor of early postoperative function, as well as symptomatic improvement, following THA. While all patients experienced symptomatic improvement by six weeks, not all patients had experienced biomechanical improvement. Understanding how preoperative hip muscle quality may affect postoperative recovery may support specialized rehabilitation or regeneration therapy to improve outcomes.

Distinct Human Stem Cell Subpopulations Drive Adipogenesis and Fibrosis in Musculoskeletal Injury

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Purpose: Fibroadipogenic progenitors (FAPs) maintain healthy skeletal muscle in homeostasis but drive muscle degeneration in chronic injuries by promoting adipogenesis and fibrosis.

Significance: We hypothesize FAP heterogeneity provides evidence for specialization of hFAP subpopulations and their roles during muscle regeneration and injury. These hFAP populations may include novel markers of progenitor and differentiating hFAPs which may lead to targeted therapeutics for prevention of fibro-fatty infiltration and enhanced muscle regeneration after injury.

Methods: To uncover how these stem cells switch from a pro-regenerative to pro-degenerative role we perform single-cell mRNA sequencing of human FAPs from healthy and injured muscles across a spectrum of injury. We identify multiple subpopulations with progenitor, adipogenic, or fibrogenic gene signatures. We utilize full spectrum flow cytometry to identify distinct FAP subpopulations based on highly multiplexed protein expression.

Results: We uncover that injury severity increases adipogenic commitment of FAP subpopulations and is driven by the downregulation of DLK1. Treatment of FAPs with DLK1 reduces adipogenesis, suggesting that during injury, reduced DLK1 within a subpopulation of FAPs may drive adipogenic degeneration.

Conclusion: This work highlights how stem cells perform varied functions depending on tissue context, by dynamically regulating subpopulation fate commitment, which can be targeted to improve patient outcomes after injury.

A Comparison of Outcomes in Ankle Syndesmosis Injuries Treated with an Aperture Fixation Device, Suture Button, and Syndesmotic Screw

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Purpose: To describe outcomes as it relates to treatment of distal femur fractures with a combination of retrograde intramedullary nail and laterally or medially based locking plates (nail-plate constructs, NPCs).

Significance: Traditionally, treatment of distal femur fractures includes constructs ranging from lateral locked plating, dual plating, or retrograde nailing. Recently, NPCs have gained popularity.

Methods: Retrospective study of all cases of NPC use spanning 2017-2022. Both native femoral and peri-implant fracture fixation were included. Data included demographics, fracture characteristics, union rates and revision surgery.

Results: In total, 56 patients underwent NPC fixation. Of these, 44% (n=25) were native distal femur fractures, with the remainder peri-implant fractures. In patients with sufficient follow-up, 89% (n=33) went on to union at an average of 7.5 months (SD +/- 3.4). Four patients underwent re-operation after their procedure involving an NPC (n=1 symptomatic hardware, n=2 atrophic nonunion, n=1 deep infection). Seven patients underwent conversion to NPC from another construct (n=1 dual plate, n=3 lateral locking plate, n=3 retrograde IMN alone) for atrophic (n=5), infectious (n=1) or recalcitrant (n=1) nonunion, 6/7 (86%) of which went on to union at an average of 11.1 months.

Conclusion: Early term outcomes show promising rates of union and low revision rates in an aging patient population. Further, this construct has been successfully utilized in revision surgery for existing distal femoral nonunions, initially treated with dual plate or single plate constructs.

Patient-Specific Alignment Utilizing Handheld Computer-Assisted Navigation for Total Knee Arthroplasty

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Purpose: Orthalign is an extramedullary computer assisted navigation device which utilizes accelerometers to provide a cost-effective, handheld intraoperative guide for total knee arthroplasty (TKA).

Significance: Prior studies have examined and supported its cut precision for mechanically aligned knees, however this is the first study examining its use in kinematic TKA.

Methods: In this retrospective review, patients who underwent TKA at a single center during 2021-2022 and maintained adequate follow up to obtain full length standing alignment films at one year post-operatively were included in this study.

Results: Overall, 33 of 34 of distal femoral cuts (97.6%) and 31 of 34 proximal tibial cuts (91.2%) successfully underwent surgery with postoperative coronal plane alignment within two degrees of the preoperatively planned bone cuts.

Conclusion: This method provides accurate intraoperative navigation for distal femur and proximal tibial cuts for both mechanical and patient-specific alignment in TKA

Association Between Same-Day Discharge Shoulder Arthroplasty and Risk of Adverse Events in Patients with American Society of Anesthesiologists Classification ≥ 3 : A Cohort Study

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Purpose: We hypothesized that patients with American Society of Anesthesiologists classification ≥ 3 (ASA ≥ 3) undergoing same-day discharge shoulder arthroplasty (SA) would not be at increased risk for postoperative events compared to inpatients.

Significance: There has been an increase in the utilization of same-day SA and a wider variety of patients are being considered for this intervention. However, the safety of same-day discharge in patients with a high medical comorbidity burden remains unknown.

Methods: Registry data were utilized to conduct a cohort study of patients ASA ≥ 3 undergoing primary anatomic or reverse SA from 2018-2020. Same-day discharge was defined as discharge prior to midnight on the day of surgery. The likelihood of 90-day events was evaluated with the use of propensity score-weighted logistic regression with noninferiority testing using a margin of 1.10.

Results: 1,814 patients underwent SA. 1,005 had same-day discharge. Same-day discharge had a lower likelihood of readmission when compared to inpatient stay SA (OR=0.64). No differences were observed for 90-day ED visits (OR=0.96), overall complication (OR=0.67), cardiac event (OR=0.68), or VTE (OR=0.91).

Conclusion: Adoption of expanded indications for SA with same-day discharge in the hospital-based setting can be considered a safe alternative to inpatient SA in appropriately selected patients.

Danger Zone in Anterolateral Plate Fixation of the Distal Tibia – A 3D CT Angiography Model

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Purpose: To use a novel 3D CT angiography (CTA) modeling technique to define the danger zone where the anterior tibial artery (ATA) is at risk during anterolateral plating of the distal tibia.

Significance: The ATA and closely associated neurovascular structures are at risk during percutaneous anterolateral plating of the distal tibia.

Methods: CTAs performed on ninety-two patients (150 lower extremities) were modeled with a 3.5mm LCP anterolateral distal tibia plate using Sectra ID7 software. The ATA was identified and the levels at which the artery intersected the plate were marked both proximally and distally.

Results: The ATA intersected the plate at a mean distance of 10.5 cm (CI 10.1 – 10.8) proximally, and distally at a mean distance of 4.6 cm (CI 4.4 – 4.9) from the central plafond. The ATA was at risk for injury as distally as hole number 1 and as proximally as hole 14 of the plate.

Conclusion: The ATA is at risk when percutaneously placing proximal screws in an anterolateral distal tibia plate. The danger zone for the ATA can be as close as 4.4 cm and as far as 10.8 cm proximal to the tibial plafond.

Combined Locking Attachment Washer (LAW) With Retrograde Intramedullary Nail for the Treatment of Distal Femoral Fractures

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Purpose: The purpose of this study is to describe outcomes in the treatment of distal femur fractures with a newer construct combining a locking attachment washer (LAW) with a retrograde intramedullary nail.

Significance: Treatment of distal femur fractures is increasing with an aging population. Treatment constructs ranging from lateral locked plating, dual plating, retrograde nailing or a combination of retrograde intramedullary nail and laterally based plate, have been debated.

Methods: A retrospective chart review was conducted at our level 1 trauma center for all cases of LAW use spanning January 2021-present. All fracture fixation constructs included the Synthes Retrograde Femoral Nailing Advanced System (RFN) with the Locking Attachment Washer (LAW) in some variation.

Results: 14 patients underwent fracture fixation involving a LAW. Follow-up averaged 7.6 months (range 0.5-20) and five patients were lost to follow-up prior to union or have not achieved union 5 months from their date of surgery. When excluding patients who have not reached sufficient follow-up, 100% (n=9) of patients went on to union, and 89% (n=8) did so without revision surgery.

Conclusion: Utilization of a LAW in the management of distal femoral fractures provides a unique tool in fracture fixation. Early term outcomes are promising.

Pediatric Cervical Spine Injury Patterns and Management Strategies: A Retrospective 10-Year Evaluation at a Level 1 Pediatric Trauma Center

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Purpose: To characterize the injury patterns and management strategies of cervical spine injuries (CSIs) in pediatric trauma patients at a Level 1 Pediatric Trauma Center.

Significance: Pediatric CSIs are rare and less understood than adult CSIs, as <1% of pediatric trauma patients sustain CSI's.

Methods: A retrospective cohort study was conducted from 2012 through 2021. All trauma patients <18 years of age who underwent cervical spine imaging were reviewed and those diagnosed with a CSI were included. Pearson chi-squared and Fisher exact tests were used to compare the demographic, clinical, and injury characteristics of patients who received conservative vs. operative treatment.

Results: 19% (60/309) of CSIs were treated surgically. On discharge from the hospital, 45% (138/309) received no intervention, 34% (106/309) were treated with a rigid collar, and 1.6% (5/309) with a cervical thoracic brace. The likelihood of operative intervention was associated with increased patient age ($p=0.006$), a higher proportion of motor vehicle accidents and sporting injuries ($p=0.01$); and was not associated with admission Glasgow Coma Scale (GCS) score, in-hospital mortality, early intubation, transfer status, or level of c-spine involvement.

Conclusion: The likelihood of operative intervention is higher with increasing patient age and with severe mechanisms of injury, but not associated with GCS on presentation, early intubation, or level of cervical spine involvement.

The Effect of Adjacent Level Osteophytes on Proximal Junctional Kyphosis After Multi-Level Thoracolumbar Fusions

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Purpose: To evaluate the effect of proximal level vertebral body osteophytes on the development of proximal junctional kyphosis (PJK).

Significance: This paper helps to further elucidate the effect of vertebral osteophytes on proximal junctional stability which may aid surgeons in selecting the proximal extent of planned fusion constructs.

Methods: Thoracic and lumbar fusions involving >5 levels were reviewed. Minimum follow-up was 6 months, mean was 16 months. Lateral radiographs were used to measure the horizontal and vertical extension of osteophytes from the native corner of the vertebral body. A “vertical ratio” (Vr) was calculated as the anterior vertical gap between intervertebral osteophytes divided by the central disc height on lateral radiographs. A “horizontal ratio” (Hr) was calculated as the length of the horizontal osteophyte extension divided by horizontal length of the native vertebral body on lateral radiographs. Preoperative, immediate postoperative, and latest postoperative radiographs were evaluated for the presence of PJK and proximal junctional failure.

Results: Sixty-one patients were included with an average age of 66. In patients with a $Vr \leq 0.5$ (representative of large vertical anterior osteophytes), 2/23 patients (8.7%) developed PJK or PJF. When Vr was greater than 0.5 (representative of small vertical anterior osteophytes), 17/38 patients (44.7%) developed PJK/PJF ($p=0.003$).

Conclusion: There is a statistically significant association between low Vr and the incidence of PJK. Adjacent level osteophytes with significant vertical extension ($Vr < 0.5$) appear to be protective against the development of PJK. This novel concept may assist preoperative radiographic evaluation and planning. In the presence of significant osteophyte formation ($Vr \leq 0.5$), the surgeon may choose to shorten the proximal extent of their instrumented fusion, theoretically reducing the morbidity and cost of surgery.

Stepwise Ponte Osteotomy: Biomechanical Pilot of a Risk Minimizing Approach

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Purpose/Significance: The Ponte osteotomy is a popular technique for correcting adolescent idiopathic scoliosis but leaves the spinal canal exposed in the thoracic spine. Here we introduce a novel technique involving a sequential approach to the Ponte osteotomy that minimizes spinal canal exposure and can be applied to multiple thoracic levels to titrate the desired degree of deformity correction.

Methods: One adult human cadaveric thoracic spine specimen was divided into sections (T1–T5, T6–T9, T10–L1). Each segment was loaded with 5 Nm under four conditions: baseline inferior facetectomy with supra/interspinous ligament release, superior articular process (SAP) osteotomy in situ, spinous process (SP) osteotomy in situ, and complete posterior column osteotomy with SP/SAP excision and ligamentum flavum release (PCO).

Results: Compared to baseline, SAP osteotomy provided 3.5%, 7.6%, and 7.2% increase in flexion/extension, lateral bending, and axial rotation, respectively. SP osteotomy increased flexion/extension, lateral bending, and axial rotation by 15%, 18%, and 10.3%, respectively. PCO increased flexion/extension, lateral bending, and axial rotation by 19.6%, 28.3%, and 12.2%, respectively.

Conclusion: Our report introduces a novel osteotomy approach where incremental increases in range of motion can be achieved with minimal spinal canal exposure and demonstrates feasibility in a cadaveric model.

Public Insurance Is Associated With a Longer Time to Surgery for Distal Radius Fractures

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Purpose: We sought to quantify the impact of insurance type on time to surgery for patients with distal radius fractures.

Significance: Emerging literature suggests delays in caring for distal radius fractures are associated with poorer outcomes; longer wait times for surgery due to insurance type may be a driver of inequity in hand surgery.

Methods: A retrospective cohort study with operatively indicated distal radius fractures was conducted. Patients were more than 18 years old and had surgery between January 1, 2018 and January 1, 2021. Patients with polytrauma, open fractures, and acute carpal tunnel syndrome were excluded.

Results: 201 patients were included. 137 (68.2%) had private insurance. 31.8% were male, and mean age was 50.3 years old. Those with private insurance had an average time from injury to surgery of 12.1 ± 0.7 days. Those with public insurance had an average of 18.2 ± 1.6 days ($p = 0.0001$). In a cox regression model, patients with public insurance had a relative hazard for surgery of 0.57 (95% confidence interval [0.42, 0.79], $p = 0.0005$).

Conclusion: Patients with public insurance are more likely to have longer wait times for surgery, suggesting insurance type may contribute to health inequities and poorer outcomes in upper extremity surgery.

Cervical Spine Conditions in United States Military Aviators: A 19-Year Retrospective Cohort

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Purpose: Evaluate incidence and risk factors for disqualifying cervical conditions in military aviators from 1997-2015.

Significance: Medical attrition of aviators results in substantial governmental cost burden (individual fighter-pilot training costs \$5.6-\$10.9M). Quantifying burden and risk factors for cervical degenerative conditions may help improve aviator retention and government savings.

Methods: The Defense Medical Epidemiological Database was queried for aviators with a diagnosis in three categories: neck pain; degenerative cervical conditions without neurologic involvement; and degenerative cervical conditions with neurologic involvement. A hurdle negative binomial regression was performed to assess the impact of sex, age, service, aircraft, and year on cervical conditions. Rates were compared to non-aviator controls.

Results: Incidence of degenerative cervical conditions ranged from 1-4/1000 person-years from 1997-2015. Aviators had a statistically significant higher risk of cervical conditions in all categories compared to controls (RR 1.4-2.0). Female sex, increasing age, and Army or Marine Corps service were associated with the highest risk of cervical conditions. No significant differences existed between aircraft types.

Conclusion: Military aviators are at elevated risk of degenerative cervical conditions compared to non-aviator controls. Targeted prevention and treatment programs for aviators of female sex, increased age, and within the Army or Marine Corps may improve aviator retention and government savings.

Intermediate Outcomes of Medial Ulnar Collateral Ligament Reconstruction Using Gracilis Allograft in Adolescent Patients

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Purpose: Allograft tendon reconstruction of the medial ulnar collateral ligament in the young elbow is a successful graft choice with low failure rates and satisfactory outcome scores.

Significance: Autograft palmaris has been the primary choice for reconstruction of the UCL in the elbows of overhead-throwing athletes. Literature has focused on technique variation vice graft choice. Little research has been conducted focusing on allograft reconstruction in young athletes or traumatic instability.

Methods: Patient records were reviewed at a single institution between 2009 - 2019 who underwent medial UCL reconstruction with minimum 2 years follow-up. Record review, allograft reconstruction, and direct survey was conducted. Outcomes measured with Timmerman-Andrews, Single Assessment Numeric Evaluation, and Conway-Jobe Score.

Results: Forty-one patients underwent allograft UCL reconstruction, 10 teenagers (40% female) met all criteria. Mean age 15.8 years, follow-up 8.0 years, SANE score 86.3, and Timmerman-Andrews Score 92.5. No patients experienced loss of range of motion, contracture, or ulnar nerve neuropathy. One revision occurred for recurrent instability.

Conclusion: Allograft reconstruction for medial UCL instability in adolescents demonstrated functional scores comparable to reported autograft reconstruction in elite and adolescent athletes. If patients and surgeon desire to avoid autograft morbidity, allograft tendon UCL reconstruction appears to be viable in adolescent athletes.

Midterm Postoperative Patient Satisfaction Scores After Coracoclavicular Ligament Reconstruction in Active Duty Military Service Members

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Purpose: The purpose of this study is to investigate postoperative patient satisfaction outcomes after CCR at minimum 1-year follow-up. We hypothesize that active-duty patients are happy with overall surgical results regardless of return to active-duty.

Significance: Midterm postoperative patient satisfaction outcomes in active-duty military members are not well documented for indicated coracoclavicular ligament reconstruction (CCR) of acromioclavicular joint (ACJ) injuries.

Methods: A preliminary sample of 15 active-duty military patients who received CCR at a Military Treatment Facility between 2018 and 2022 were retrospectively reviewed. Subjects voluntarily participated in a telephone survey with research staff. Postoperative patient satisfaction, time to return to full duty, instability, complications were collected. Descriptive statistics were analyzed.

Results: 86.67% (13/15) patients reported being either satisfied or very satisfied with the overall surgical outcome. 73.33% (11/15) returned to full duty at an average of 7.91 +/-4.39 months postop. The Average ASES score was 81.56 +/-12.16. 6.67% (1/15) required revision for loss of reduction with no further complications.

Conclusion: CCR of indicated ACJ injuries resulted in good patient satisfaction (86.67%), reasonable return to active-duty rates, and low complication rates. Patient satisfaction data and outcomes specific to this population can help inform patient-surgeon decision making with unique demands of prompt return to active-duty.

A Comparison of Prognostic Models to Facilitate Surgical Decision-Making For Patients with Spinal Metastatic Disease

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Purpose: Compare performance of and provide cutoff values for commonly used prognostic models for spinal metastases.

Significance: Determine performance of these models at clinically relevant time points for providing clinically applicable cutoff values for the models.

Methods: Sixty-four patients undergoing surgery from 2015-2022 for spinal metastatic disease were identified. Revised Tokuhashi, Tomita, Modified Bauer, NESMS, and Skeletal Oncology Research Group were calculated for each patient. Model calibration and discrimination for predicting survival at three months, six months, and final follow-up were evaluated using the Brier score and Uno's C, respectively. Hazard ratios for survival were calculated for the models. The Contral and O'Quigley method was utilized to identify cutoff values for the models discriminating between survival and non-survival at three-months, six-months, and final follow-up.

Results: Each of the models demonstrated similar performance in predicting survival at three-months, six-months, and final follow-up. Cutoff scores that best differentiated patients likely to survive beyond three months included the Revised Tokuhashi score=10, Tomita score=four, Modified Bauer score=three, and NESMS=one.

Conclusion: We found comparable efficacy among the models in predicting survival at clinically relevant time points. Cutoff values provided herein may assist surgeons and patients when deciding whether to pursue surgery for spinal metastatic disease.

Sociodemographic Characteristics of Patients Undergoing Surgery for Metastatic Disease of the Spine

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Purpose: Determine sociodemographic characteristics of patients undergoing surgery for metastatic spine disease.

Significance: Some patients, particularly those socioeconomically deprived, are diagnosed with primary and/or metastatic cancer only after presenting to the emergency department

Methods: Retrospective case series of patients 18 years and older presenting to ED with metastatic spine disease requiring surgery. Sociodemographic characteristics were estimated using Social Deprivation Index (SDI) and Area Deprivation Index (ADI). Univariate log-rank tests and Kaplan-Meier curves were used to assess differences in survival for predictors of interest.

Results: Between 2015-2021, 64 patients underwent surgery for metastatic spine disease. Mean SDI and ADI were 61.5 ± 28.0 and 7.7 ± 2.2 . 28.1% of patients were diagnosed with primary cancer for the first time while 39.1% were diagnosed with metastatic cancer for the first time. 3-month, 6-month, and all-time mortality rates were 26.7%, 39.5%, and 50%, respectively. Payor plan was significant at 3 months ($P=0.02$), and palliative consultation was significant at 3 months ($P=0.007$) and 6 months ($P=0.03$).

Conclusion: In this study, 28.1% of patients were diagnosed with cancer for the first time. Three-month and 6-month mortality rates were 26.7% and 39.5%. Mortality was markedly associated with palliative care consultation and insurance status, but not with SDI and ADI.

OREF gratefully acknowledges these Corporate Associates



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