

P. Douglas Kiester, MD
Professor of Orthopaedics—Spine
University of California—Irvine

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| 1998—Present | Professor of Orthopaedics, University of California, Irvine, Irvine, CA. |
| 1998—2003 | V.A. Hospital/Spinal Cord Rehabilitation Center, Long Beach, CA. |
| 1988—1998 | Private Practice in Beverly Hills, CA. Privileges at Cedars-Sinai Medical Center, Beverly Hills Medical Center, Century City Hospital, Midway Hospital Medical Center, St. John's Ambulatory Surgery Center in Beverly Hills, CA. |
| 1987—1988 | Spine Surgery fellowship, Rush-Presbyterian St. Luke's, Chicago, IL. Thomas McNeill, M.D. and Gunner Anderson, M.D. |
| 1985—1987 | Orthopaedic Residency, served as Chief Resident Bronx-Lebanon Medical Center, Bronx, New York, NY. |
| 1983—1985 | Orthopedic Residency, University of Nebraska, Omaha, NE. |
| 1982—1983 | Biomechanics Fellowship, Rancho Los Amigos, Downey, CA. |
| 1981—1982 | Surgical Internship, LA County/USC, Los Angeles, CA. |
| 1976—1981 | MD degree. Indiana University, Indianapolis, IN. |
| 1975—1976 | Ph.D. Studies, Biophysics and Computing, University of Utah. |
| 1971—1976 | BS, Chemistry, Cum Laude, University of Utah. |

Licenses:

1982—present MD California.

Certifications:

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| 1990—present | Diplomate, American Board of Orthopedic Surgery, Recert. 2000, 2010. |
| 1991—present | Fellow, American Academy of Orthopaedics. |
| 2005—present | Certified in traffic accident reconstruction by ACTAR (The Accreditation Commission of Traffic Accident Reconstructionists). |
| 1991—1994 | Qualified Medical Examiner (QME). |

Research Appointments:

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| 1974—1976 | Department of Chemistry , University of Utah Basic Air Force study on high temperature hydraulic fluids. Used Electron Spin Resonance, Nuclear Magnetic Resonance, Infra-Red, Ultra Violet and Gas Chromatography/Mass Spectrophotometry. |
| 1976 | Biophysics and Computing , University of Utah Converting analog force experimental outputs to digital. |
| 1977—1978 | Hematology , Robert Bahner, MD, Indiana University. Lipid membrane studies on Chedlak-Higashi mice. |
| 1978—1979 | Anesthesiology , Raymond Paradise, MD Anesthesia levels in puppies. |
| 1982—1983 | Gait laboratory , Jacqueline Perry, MD, Rancho Los Amigos Acquired from V.A. \$67,000 grant to study prosthetic feet SACH vs. SAFE Improved running/walking energy cost. Developed equipment to analyze forces around the shoulder while pitching. |

Professional Organization Memberships:

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| 1989—2002 | American Medical Association. |
| 1989—1998 | Los Angeles County Medical Association. |
| 1991—present | Western Orthopaedic Association. |
| 1991—present | American Academy of Orthopaedic Surgeons. |
| 1998—present | Orange County Medical Association. |
| 2006—present | California Association of Accident Reconstruction Specialists. |
| 2008—present | Accident Reconstruction Communications Network. |
| 2014—present | European Spine Society. |

Presentations at Scientific Meetings and Societies:

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| May 1989 | The Relationship of Dose to Response for Chymopapain. International Society for the Study of the Lumbar Spine, Kyoto, Japan. |
| June 1989 | Proper Dosage for Cymopapain Injections as Demonstrated in a Rabbit Model. North American Spine Society, Quebec, Canada. |
| May 1998 | A New Theory for the Cause and Progression of Adolescent Scoliosis. UC—Irvine. |
| June 1999 | Cox 1, Cox 2 and Non-Steroidal Anti-Inflammatory Treatment. Pediatric Colloquium, Fountain Valley, CA. |
| May 2006 | Update on Major Deformity and Scoliosis Fusion Techniques. Multidisciplinary Spine Symposium, UC—Irvine. |
| Oct. 2006 | The two Axes of Lumbar Rotation, a New Motion Model. Department of Neurosurgery Grand Rounds, UC—Irvine. |
| Aug. 2010 | Concave Rotation in Scoliosis of Scheuermann's Kyphosis. Western Orthopaedic Assoc., Monterey, CA |
| June 2011 | How balance is Maintained During Lumbar Rotation. UC—Irvine Spine Symposium. |
| June 2013 | Localization of the Adolescent Scoliosis tether using CT scans. Western Orthopaedic Assoc., Portland, OR. |
| June 2014 | How Tethers Link Rotation and Displacement Which Results in Vertebral Body Tilting. IMAST, Barcelona, Spain. |
| July 2014 | The Biomechanics of Adolescent Scoliosis. Spine Summit, Dana Point, CA. |

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- Feb. 2015 Roman Stone Arches and Surgically Reducing AIS Curves. Spine Summit, Park City, UT
- April 2015 Lumbar Rotation, Maintaining Standing Balance, Disk function, and the Etiology of Adult Scoliosis. Wilson—Boost Interurban Club.
- July 2015 How 2 Axis Lumbar Rotation helps us Maintain Standing Balance. Western Orthopaedic Assoc. Coeur d'Alene, ID.
- 1998-2016 Community and resident lectures, and national case presentations are not listed.

Publications:

1. Ritter, Merrill A., Kiester, P. Douglas: *Femoral Stem Failures in Total Hip Arthroplasty: An Unusual Casual Mechanism*. Clinical Orthopedics and Related Research, 1982 May (165): 176-9.
2. Kiester PD, Connolly JF. *Fibular Head Dislocation—another differential in the diagnosis of knee injury*. Nebraska Medical Journal, 1985 Jan;70(1):26-7.
3. Kiester, P.D., Duke, A.D., *Is It Malingering, or is it "Real"?, Eight Signs That Point To Non-Organic Back Pain: Postgraduate Medicine*, December 1999: 106 (7): 77-84.
4. Alli, B., Kiester, P.D., *Psychological Aspects Of Back And Neck Pain, In The Practice of Minimally Invasive Spinal Technique*, Editors: Savitz, Chiu, Yeung: Pub CCS, Lima, Ohio , 2000 p.181-186 (Book Chapter).
5. Rosen, C.; Kiester, P.D.; Lee, T. Q.; *Lumbar Disk Replacement Failures: Review of 29 Patients and Rationale for Revision*, Orthopedics, 2009; 32(8), p. 256.
6. Drivers of surgery for the degenerative hip, knee, and spine: a systematic review. Bederman SS, Rosen CD, Bhatia NN, Kiester PD, Gupta R. Clin Orthop Relat Res. 2012 Apr;(470(4))1090-105.
7. Use of lateral access in the treatment of the revision spine patient. Bederman SS, Le VH, Pahlavan S, Kiester PD, Bhatia NN, Deviren V., ScientificWorldJournal. 2012;2012:308209.
8. Fixation techniques for complex traumatic transverse sacral fractures: a systematic review. Bederman SS, Hassan JM, Shah KN, Kiester PD, Bhatia NN, Zamorano DP. Spine (Phila Pa 1976). 2013 Jul 15;38(16):E1028-40.
9. Robotic Guidance for S2-Alar-Iliac Screws In Spinal Deformity Correction. Bederman SS, Hahn P, Colin V, Kiester DP, Bhatia NN. Clin Spine Surg. 2016 May 26.
10. Surgical techniques for spinopelvic reconstruction following total sacrectomy: a systematic review. Bederman SS, Shah KN, Hassan JM, Hoang BH, Kiester PD, Bhatia NN. Eur Spine J. 2014 Feb;23(2):305-19.
11. ICD-10 and Its Relevance to Spine Surgeons. Doermann, Alex; Massel, Dustin H.; Mayo, Benjamin C.; Kiester, Douglas; Bhatia, Nitin; Lee, Yu-Po. Contemporary

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Spine Surgery. 17(9):1-5, September 2016.

12. Does the Addition of Tobramycin Decrease Infection Risk in Patients undergoing Lumbar Spinal Instrumented Fusions? Lee, Yu-Po; Bhatia, Nitin N.; Kiester, P D; Farhan, Saif Bassam. (thespnejournalonline.com); <http://dx.doi.org/10.1016/j.spinee.2016.07.066>.
13. Smith-Peterson and pedicle subtraction osteotomies. Halim, Alex; Kiester, P Douglas; Lee, Yu-Po. DOI: 10.1053/j.semss.2016.12.004.

Creative Activities:

I have filed and obtained many patents. The most lucrative was the remote-powered growth rod designed to treat adolescent scoliosis. Ellipse Technologies developed the patent into the MAGEC Magnetically-Controlled Growth Rod for treating scoliosis and its spin-off, the PRECICE Rod, for lengthening long bones and treating long- bone deformities. These devices were the company's only two products. In 2015, Ellipse technologies was sold to Nuvasive for \$385 million dollars.

For my patent work, I have acquired and learned how to use multiple types of 3D drawing software. Besides patent work, I have used these tools to better understand the biomechanics of the spine and to draw improvements for many tools and implants for industry. The biomechanically-active posterior tether which causes adolescent scoliosis was described very accurately by William Adams in his 300-page book in 1865. Nonetheless, modern scoliosis surgeons still call it adolescent *idiopathic* scoliosis, indicating that they do not understand either the biomechanics or the cause of the disorder.

Using the software to analyze adolescent scoliosis on CT scans, I was able to precisely locate the tether and later anatomically demonstrate it at the time of surgery. I have also demonstrated that release of this ligamentous tether significantly and safely improves the adolescent scoliosis curve.

I have also used this 3D modeling software to attack the difficult problem of the biomechanics of adult scoliosis. Unlike adolescent scoliosis which is caused by a tether that deforms the youth's spine during growth, adult scoliosis is the result of the vertebral disk collapsing in a rotated position. Lumbar spinal rotation is controlled by the facet joints. This understanding explains why lumbar artificial disk replacements were such a failure. The design engineers continue to be unaware of the rotational function of the facet joints in the lumbar spine.

I am also a father and family man with 6 children.