



Universiteit
Leiden
The Netherlands

In vivo biomechanics of cruciate ligament injuries

Van de Velde, S.K.

Citation

Van de Velde, S. K. (2016, November 29). *In vivo biomechanics of cruciate ligament injuries*. Retrieved from <https://hdl.handle.net/1887/44484>

Version: Not Applicable (or Unknown)

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/44484>

Note: To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/44484> holds various files of this Leiden University dissertation.

Author: Van de Velde, S.K.

Title: In vivo biomechanics of cruciate ligament injuries

Issue Date: 2016-11-29

ACKNOWLEDGEMENTS

None of the data presented in this thesis would have been possible without the work of the co-authors. A special thanks goes to Drs. Guoan Li, Louis DeFrate and Thomas Gill IV for introducing me to the world of orthopaedic biomechanical research.

I thank Prof. dr. Rob Nelissen and Dr. Ewoud van Arkel whose never-failing encouragement is responsible for this thesis.

The administrative help of Anika Hoogenstraaten was greatly appreciated.

Finally, I would like to thank Dr. Suzanne Yandow for showing me that Oahu has more to boast than beaches and pineapple plantations, namely intriguing pediatric hip disorders.

CURRICULUM VITAE

Samuel Van de Velde was born on July 13th 1978, in Mechelen, Belgium. After studying Latin and Greek at the Sint Romboutscollege in Mechelen, Belgium, he started his medical training at the Catholic University of Louvain, Belgium. During medical training, he completed a clinical rotation with Dr. Suzanne Yandow at the University of Hawaii/Shriners Hospital for Children. There, he studied protrusio acetabuli in children with certain connective tissue disorders – such as Marfan syndrome and Congenital Contractural Arachnodactyly.

After graduating *cum laude* from medical school in 2003 and clinical internships in orthopaedics and general surgery in Amsterdam and Leiden, the Netherlands, he joined the Bioengineering Laboratory at the Massachusetts General Hospital in Boston, Massachusetts (USA), as a postdoctoral research fellow in 2005. With Prof. Guoan Li, he initiated the study into the biomechanical pathogenesis of posttraumatic osteoarthritis following rupture of one of the cruciate ligaments in the knee joint, as outlined in this thesis. He was promoted to research faculty at Harvard Medical School in 2009. Some of the accolades of his stay in Boston include the O'Donoghue Sports Injury Research Award, a master's degree from the Harvard School of Public Health, and the Ruth Kirschstein Fellowship Award from the National Institutes of Health.

In 2011, he returned to the Netherlands to commence his Orthopaedic residency at Leiden University Medical Center, Leiden, and Medical Center Haaglanden – Bronovo, The Hague, under the supervision of Prof. dr. Rob Nelissen and Dr. Ewoud van Arkel. He is currently completing his final year of orthopaedic training.

In January 2017, he will complete a six-month visiting scholarship with Prof. dr. Mininder Kocher at Boston Children's Hospital. Here he will study the clinic and biomechanics of pediatric anterior cruciate ligament injury and reconstruction. In July 2017, he will move to Toronto, Canada, for the one-year Pediatric Orthopaedic Fellowship at The Hospital for Sick Children.

He lives in The Hague with his wife Jolie and three children, Svea, Finnegan and Beckett.

PUBLICATIONS

Publications related to this thesis

Van de Velde SK, Gill TJ, Li G: Evaluation of kinematics of anterior cruciate ligament-deficient knees with use of advanced imaging techniques, three-dimensional modeling techniques, and robotics. *J Bone Joint Surg Am*. 2009 Feb;91 Suppl 1:108-14.

Van de Velde SK, Hosseini A, Kozanek M, Gill TJ, Rubash HE, Li G: Application guidelines for dynamic knee joint analysis with a dual fluoroscopic imaging system. *Acta Orthop Belg*. 2010 Feb;76(1):107-13.

Li G, **Van de Velde SK**, and Bingham JT: Validation of a Non-invasive Fluoroscopic Imaging Technique for the Measurement of Dynamic Knee Joint Motion. *J Biomech*. 2008;41(7):1616-22.

Van de Velde SK, Bingham JT, Hosseini A, Kozanek M, DeFrate LE, Gill TJ, Li G: Increased in-vivo tibiofemoral cartilage contact deformation in anterior cruciate ligament-deficiency. *Arthritis Rheum*. 2009 Dec;60(12):3693-702.

Van de Velde SK, Bingham JT, Gill TJ, Li G: Analysis of tibiofemoral cartilage deformation in the posterior cruciate ligament-deficient knee. *J Bone Joint Surg Am*. 2009 Jan;91(1):167-75.

Van de Velde SK, Gill TJ, DeFrate LE, Papannagari R, Li G: The effect of anterior cruciate ligament deficiency and reconstruction on the patellofemoral joint. *Am J Sports Med*. 2008 Jun;36(6):1150-9.

Van de Velde SK, Gill TJ, Li G: Dual Fluoroscopic Analysis of the PCL-Deficient Patellofemoral Joint During Lunge. *Med Sci Sports Exerc*. 2009 Jun;41(6):1198-205.

Van de Velde SK, DeFrate LE, Gill TJ, Moses JM, Papannagari R, Li G: The effect of anterior cruciate ligament deficiency on the in vivo elongation of the medial and lateral collateral ligaments. *Am J Sports Med*. 2007 Feb;35(2):294-300.

Van de Velde SK, Kernkamp WA, Hosseini A, LaPrade RF, van Arkel E, Li G. In Vivo Elongation of the Anterolateral Ligament and Related Extra-Articular Reconstructions. *Am J Sports Med*, *in press*.

Other Publications

Van de Velde S, Fillman R, Yandow S: Protrusio Acetabuli in Marfan Syndrome: Indication for Surgery in a Skeletally Immature Marfan Patient. *J Pediatr Orthop*. 2005 Sep-Oct;25(5):603-6.

Van de Velde S, Fillman R, Yandow S: Current Concepts – Protrusio Acetabuli in Marfan Syndrome: History, Diagnosis, and Treatment. *J Bone Joint Surg Am*. 2006 Mar;88(3):639-46.

Van de Velde S, Fillman R, Yandow S: The aetiology of protrusio acetabuli. Literature review from 1824 to 2006. *Acta Orthop Belg*. 2006 Oct;72(5):524-9.

McClure SD, **Van de Velde S**, Fillman R, Yandow S: New Finding of Protrusio Acetabuli in Two Families with Congenital Contractural Arachnodactyly. *J Bone Joint Surg Am*. 2007 Apr;89(4):849-54.

Zarins B, **Van de Velde SK**, and Gill TJ: Advances in ACL Reconstruction: Current Concepts and Controversies in ACL Surgery. *The Orthopaedic Journal at Harvard Medical School*, epub Dec 2007.

Nha KW, Papannagari R, Gill TJ, **Van de Velde SK**, Freiberg AA, Rubash HE, Li G: In-vivo Patellar Tracking: Clinical Motions and Patellofemoral Indices. *J Orthop Res*. 2008 Aug;26(8):1067-74.

Bingham JT, Papannagari R, **Van de Velde SK**, Gross C, Gill TJ, Felson DT, Rubash HE, Li G: In vivo cartilage contact deformation in the healthy human tibiofemoral joint. *Rheumatology (Oxford)*. 2008 Nov;47(11):1622-7.

Kozanek M, **Van de Velde SK**, Gill TJ, Li G: The Contralateral Knee Joint in Cruciate Ligament Deficiency. *Am J Sports Med*. 2008 Nov;36(11):2151-7.

Kozanek M, Fu EC, **Van de Velde SK**, Gill TJ, Li G: Posterolateral Structures of the Knee in Posterior Cruciate Ligament Deficiency. *Am J Sports Med*. 2009 Mar;37(3):534-41.

Van de Velde SK, Pearle AD. Section VI: Malalignment and ligamentous injury. *J Bone Joint Surg Am*. 2009 Feb;91 Suppl 1:77.

Li G, Hosseini A, Liu F, **Van de Velde SK**, Kozanek M: New Fluoroscopic Imaging Technique for Investigation of 6DOF Knee Kinematics during Treadmill Gait. *J Orthop Surg Res*. 2009 Mar 13;4:6.

Kozanek M, Hosseini A, **Van de Velde SK**, Liu F, Gill TJ, Rubash HE, Li G: Tibiofemoral kinematics and condylar motion during the stance phase of gait. *J Biomech*. 2009 Aug 25;42(12):1877-84.

Gill TJ, **Van de Velde SK**, Wing DW, Oh LS, Li G: 2009 AOSSM O'Donoghue Sports Injury Research Award paper: Tibiofemoral and Patellofemoral Kinematics Following Reconstruction of an Isolated Posterior Cruciate Ligament Injury. *Am J Sports Med.* 2009 Dec;37(12):2377-85.

Liu F, Hosseini A, Kozanek M, **Van de Velde SK**, Gill TJ, Rubash HE, Li G: In-vivo Tibiofemoral Cartilage Deformation during the Stance Phase of Gait. *J Biomech.* 2010 Mar 3;43(4):658-65.

Hosseini A, **Van de Velde SK**, Kozanek M, Gill TJ, Grodzinsky AJ, Rubash HE, Li G. In-vivo time-dependent creep articular cartilage contact behavior of the tibiofemoral joint. *Osteoarthritis Cartilage.* 2010 Jul;18(7):909-16.

Ferry AT, **Van de Velde SK**, Li G, Asnis P, Zarins B, Gill TJ. Revision anterior cruciate ligament reconstruction: preoperative planning and technical considerations. *The Orthopaedic Journal at Harvard Medical School*, epub Dec 2010.

Kozanek M, **Van de Velde SK**, Hosseini A, Gill TJ, Li G. Biomechanics of ACL Deficiency and Contemporary Reconstruction Techniques. In *Anterior Cruciate Ligament (ACL): Causes of Injury, Adverse Effects and Treatment Options* (Ed. Yeager CR), 2010;29-60.

Van de Velde SK, Li G, Oh LS, Robertson W, Gill TJ. The improvement of outcomes in posterior cruciate ligament reconstruction: a case for joint biomechanics. *Minerva Ortop Traumatol*, 2010;61:353-64.

Van de Velde SK, Gill TJ. Treatment for acute anterior cruciate ligament tear. *N Engl J Med.* 2010 Nov 4;363(19):1871-2.

Hosseini A, Gill TJ, **Van de Velde SK**, Li G. Estimation of in vivo ACL force changes in response to increased weightbearing. *J Biomech Eng.* 2011 May;133(5):051004.

Kozanek M, Hosseini A, **Van de Velde SK**, Moussa ME, Gill TJ, Li G. Kinematic Evaluation of the Step-up Exercise in Anterior Cruciate Ligament Deficiency. *Clin Biomech (Bristol, Avon).* 2011 Nov;26(9):950-4.

Hosseini A, Lodhia P, **Van de Velde SK**, Asnis PD, Zarins B, Gill TJ, Li G. Tunnel position and graft orientation in failed anterior cruciate ligament reconstruction: a clinical and imaging analysis. *Int Orthop.* 2012 Apr;36(4):845-52.

Gill TJ, **Van de Velde SK**, Carroll K, Robertson WJ, Heyworth B. Surgical technique: Aperture fixation in PCL reconstruction: applying biomechanics to surgery. *Clin Orthop Relat Res.* 2012 Mar;470(3):853-60.

Van de Velde SK. Behind Enemy Lines – A Year at the Harvard School of Public Health. *The Harvard Orthopaedic Journal at Harvard Medical School*, epub Dec 2011.

Hosseini A, **Van de Velde SK**, Gill TJ, Li G. Tibiofemoral cartilage contact biomechanics in patients after reconstruction of a ruptured anterior cruciate ligament. *J Orthop Res*. 2012 Nov;30(11):1781-8.

Carroll KM, Cvetanovich G, Heyworth BE, **Van de Velde S**, Gill TJ. Approach to Management of the Patient with the Multiligament-Injured Knee. *Harvard Orthopaedic Journal*. 2013 Dec;15:54-64.

Kornaat PR, **Van de Velde SK**. Bone Marrow Edema Lesions in the Professional Athlete. *Am J Sports Med*. 2014 May;42(5):1242-6.

Schaasberg W, van der Steenhoven TJ, **Van de Velde SK**, Valstar ER, Nelissen RGHH. Feasibility of Osteosynthesis of Fractured Cadaveric Hips Following Preventive Elastomer Femoroplasty. *Clin Biomech (Bristol, Avon)*. 2014 Aug;29(7):742-6.

Van der Steenhoven TJ, Staffhorst B, **Van de Velde SK**, Nelissen RGHH, Verhofstad MH. Complications and institutionalization are almost doubled after second hip fracture surgery in the elderly patient. *J Orthop Trauma*. 2015 Mar;29(3):e103-8.

Kernkamp WA, **Van de Velde SK**, Bakker EW, van Arkel E. Anterolateral extra-articular soft tissue reconstruction in persistent anterolateral rotatory instability of the knee after anterior cruciate ligament reconstruction. *Arthroscopy Techniques*, 2015 Dec;4(6):e863–e867.

Van der Wal RJ, **Van de Velde SK**, van Arkel ER. The Approach to Meniscal Lesions in the Netherlands; A Paradigm Shift. *Ned Tijd Orthop*. 2016, 23(2).

Kernkamp WA, **Van de Velde SK**, Tsai TY, Hosseini A, van Arkel E, Li G. In Vivo Anterolateral Ligament Length Change in the Healthy Knee during Functional Activities - A Combined Magnetic Resonance and Dual Fluoroscopic Imaging Analysis. *Arthroscopy*. 2016, *in press*.

Kernkamp WA, Li G, **Van de Velde SK**. The Anterolateral Ligament: a Closed Chapter? *Ann Trans Med*. 2016, *in press*.

Abstracts, Poster Presentations and Exhibits Presented at Professional Meetings

DeFrate LE, **Van de Velde SK**, Papannagari R, Moses JM, Gill TJ, Li G: Injury to the Anterior Cruciate Ligament Alters the In Vivo Length of the Collateral Ligaments. In: 6th International Symposium on Ligaments & Tendons-VI, Chicago, IL, 2006.

Van de Velde SK, Papannagari R, DeFrate LE, Gill TJ, Moses JM, Li G: Reconstruction of the Injured Anterior Cruciate Ligament Does Not Restore Normal Patellofemoral Cartilage Contact Kinematics. In: 7th International Symposium on Ligaments & Tendons-VII, San Diego, CA, 2007.

Van de Velde SK, DeFrate LE, Papannagari R, Gill TJ, Moses JM, Li G: The In Vivo Elongation and Orientation of the Patellar Tendon After Injury to the Anterior Cruciate Ligament. In: Trans ORS; Feb, 2007, San Diego, CA.

Van de Velde SK, DeFrate LE, Papannagari R, Gill TJ, Moses JM, Li G: The In Vivo Patellofemoral Cartilage Contact Kinematics Changes After Anterior Cruciate Ligament Injury. In: Trans ORS; Feb, 2007, San Diego, CA.

Van de Velde SK, DeFrate LE, Papannagari R, Gill TJ, Moses JM, Li G: The Effect of Anterior Cruciate Ligament Injury on the In Vivo Elongation of the Medial and Lateral Collateral Ligaments. In: Trans ORS; Feb, 2007, San Diego, CA.

Van de Velde SK, DeFrate LE, Papannagari R, Gill TJ, Moses JM, Li G: The In Vivo Elongation and Orientation of the Patellar Tendon After Injury to the Anterior Cruciate Ligament. In: 4th Annual Meeting of the International Chinese Hard Tissue Society, San Diego, CA, 2007.

Li G, Bingham J, Papannagari R, **Van de Velde S**, Hosseini A: Validation of a Dual Fluoroscopic System for Measurement of Dynamic Knee Motion. In: Asian-Pacific Biomechanics Conference, 2007.

Van de Velde SK, Gill TJ, DeFrate LE, Papannagari R, Li G. Reconstruction of the Injured Anterior Cruciate Ligament Does Not Restore the Normal Patellofemoral Joint Function. In: American Orthopaedic Society for Sports Medicine Specialty Day; March, 2008; San Francisco, CA.

Van de Velde SK, Bingham JT, DeFrate LE, Gill TJ, Li G. Why does the ACL-deficient knee develop osteoarthritis? In: Trans ORS; March, 2008; San Francisco, CA.

Van de Velde SK, DeFrate LE, Gill TJ, Papannagari R, Li G. ACL Deficiency Alters Patellar Tracking. In: Trans ORS; March, 2008; San Francisco, CA.

Van de Velde SK, DeFrate LE, Gill TJ, Papannagari R, Li G. The Patellar Tendon after ACL Reconstruction with a Bone-patellar tendon-bone Autograft. In: Trans ORS; March, 2008; San Francisco, CA.

Bingham JT, **Van de Velde SK**, Li G. Validation of a Non-invasive Imaging Technique for the Accurate Measurement of Dynamic Knee Joint Motion. In: Trans ORS; March, 2008; San Francisco, CA.

Van de Velde SK, Gill TJ, DeFrate LE, Papannagari R, Li G. The Patellar Tendon After ACL Reconstruction With a Bone-Patellar Tendon-Bone Autograft. In: Trans ORS; March, 2008; San Francisco, CA.

Van de Velde SK, Bingham JT, DeFrate LE, Gill TJ, Li G. ACL-Reconstruction & Cartilage Deformation. In: 8th International Symposium on Ligaments & Tendons; March, 2008; San Francisco, CA.

Van de Velde SK, Bingham JT, DeFrate LE, Gill TJ, Li G. Cartilage Deformation in the ACL-Reconstructed Knee. In: Ann. Meeting of the American Orthopaedic Society for Sports Medicine; July, 2008; Orlando, FL.

Kozanek M, Fu EC, **Van de Velde SK**, Gill TJ, Li G. Posterolateral Structures of the Knee in PCL Deficiency. In: 76th Annual Meeting of the American Academy of Orthopaedic Surgeons; March, 2009; Las Vegas, NV.

Kozanek M, **Van de Velde SK**, Gill TJ, Li G. The Contralateral Knee Joint in Cruciate Ligament Deficiency. In: 76th Annual Meeting of the American Academy of Orthopaedic Surgeons; March, 2009; Las Vegas, NV.

Altman K, **Van de Velde SK**, Gill TJ, Bellemans J, Li G: Is the 'Normal' Contralateral Knee Still Normal, Two Years Following PCL Reconstruction? In: Trans ORS; Feb, 2009; Las Vegas, NV.

Van de Velde SK, Wing DW, Oh L, Gill TJ, Li G: PCL Reconstruction Successfully Restores the AP Translation of the Tibia. In: Trans ORS; Feb, 2009; Las Vegas, NV.

Van de Velde SK, Gill TJ, Li G. The Patellofemoral Joint in PCL Deficiency: Defining a Safe Range of Motion. In: Trans ORS; Feb, 2009; Las Vegas, NV.

Van de Velde SK, Bingham JT, Gill TJ, Li G. The Location and Magnitude of Cartilage Deformation in PCL Deficiency: an Injurious Jab and Cross Combo. In: Trans ORS; Feb, 2009; Las Vegas, NV.

Liu F, **Van de Velde SK**, Wing DW, Gill TJ, Li G. Patellar Tracking in the PCL-Reconstructed Knee. In: Trans ORS; Feb, 2009; Las Vegas, NV.

Kozanek M, Fu EC, **Van de Velde SK**, Gill TJ, Li G. PCL Deficiency Alters the Elongation of Posterolateral Structures of the Knee. In: Trans ORS; Feb, 2009; Las Vegas, NV.

Kozanek M, Hosseini A, Liu F, **Van de Velde SK**, Gill TJ, Rubash HE, Li G. Tibiofemoral Kinematics During the Stance Phase of Gait. In: Trans ORS; Feb, 2009; Las Vegas, NV.

Van de Velde SK, Bingham JT, DeFrate LE, Gill TJ, Li G. Cartilage Deformation, ACL reconstruction, and OA Development. In: Trans ORS; Feb, 2009; Las Vegas, NV.

Hosseini A, Kozanek M, Liu F, **Van de Velde SK**, Gill T, Li G. In-Vivo Kinematics of the Anterior Cruciate Ligament during Gait on Treadmill. In: Trans ORS; Feb, 2009; Las Vegas, NV.

Gill TJ, **Van de Velde SK**, Wing DW, Oh LS, Li G. Tibiofemoral and Patellofemoral Kinematics Following Reconstruction of an Isolated PCL Injury. In: Annual Meeting of the American Orthopaedic Society for Sports Medicine; July, 2009; Keystone, CO.

Van de Velde SK, Wing DT, O LS, Gill TJ, Li G. Analysis of Tibiofemoral Cartilage Deformation in the PCL-Reconstructed Knee. In: Trans ORS; March, 2010; New Orleans, LA.

Van de Velde SK, Hosseini A, Kozanek M, Li G. Accuracy and Precision of Tibiofemoral Cartilage Thickness Measurement by 3T MR Imaging. In: Trans ORS; March, 2010; New Orleans, LA.

Van de Velde SK, Gill TJ, Li G. Cartilage Contact Characteristics in ACL Deficiency. In: Trans ORS; March, 2010; New Orleans, LA.

Van de Velde SK, Gill TJ, Li G. The Location of Peak Cartilage Contact Deformation in ACL Deficiency. In: Trans ORS; March, 2010; New Orleans, LA.

Kozanek M, Hosseini A, **Van de Velde SK**, Kassel D, Fu E, Sutton K, Gill TJ, Li G. Does Anterior Cruciate Ligament Deficiency Alter Knee Motion during Low Impact Daily Activities? In: Trans ORS; March, 2010; New Orleans, LA.

Kozanek M, Hosseini A, **Van de Velde SK**, Sutton K, Passias P, Rubash HE, Gill TJ, Li G. In-vivo Tibiofemoral Kinematics during Daily Functional Activities. In: Trans ORS; March, 2010; New Orleans, LA.

Hosseini A, **Van de Velde SK**, Kozanek M, Gill TJ, Grodzinsky AJ, Rubash HE, Li G. In-vivo Creep Deformation of Tibiofemoral Articular Cartilage. In: Trans ORS; March, 2010; New Orleans, LA.

Hosseini A, Kozanek M, **Van de Velde SK**, Sutton K, Gill TJ, Li G. In-Vivo Kinematics of the Anteromedial and Posterolateral Bundles of the Anterior Cruciate Ligament during Low-Impact Daily Activities. In: Trans ORS; March, 2010; New Orleans, LA.

Liu F, Kozanek M, Hosseini A, **Van de Velde SK**, Gill TJ, Li G. In vivo Tibiofemoral Cartilage Contact Area and Deformation during the Stance Phase of Gait. In: Trans ORS; March, 2010; New Orleans, LA.

Liu F, Kozanek M, Hosseini A, **Van de Velde SK**, Gill TJ, Rubash HE, Li G. In Vivo Tibiofemoral Contact Kinematics during the Stance Phase of Walking. In: Trans ORS; March, 2010; New Orleans, LA.

Gill TJ, Robertson W, **Van de Velde SK**, Redford KM, Carroll K, Li G. Combined Proximal and Distal Tibial Fixation in PCL Reconstruction. In: Trans ORS; March, 2010; New Orleans, LA.

Van de Velde SK, Gill TJ, Li G. Elongation and Orientation Patterns of the Theoretical ACL Bundles Following Injury. In: Trans ORS; March, 2010; New Orleans, LA.

Hosseini A, Kozanek M, **Van de Velde SK**, Driscoll SJ, Garner C, Gill TJ, Li G. In-Vivo Kinematics of the ACL Bundles during Low-Impact Daily Activities. In: Trans ORS; Jan, 2011; Long Beach, CA.

Ferry AT, **Van de Velde SK**, LeBoff Williams A, Li G, Asnis P, Zarins B, Gill TJ. Revision Anterior Cruciate Ligament Reconstruction: A Review of 153 cases. In: Trans ORS; Jan, 2011; Long Beach, CA.

Van de Velde SK, Hosseini A, Kozanek M, Gill TJ, Li G. Tibiofemoral Cartilage Contact Biomechanics in Patients after ACL Reconstruction. In: Trans ORS; Jan, 2011; Long Beach, CA.

Kozanek M, Hosseini A, Moussa M, **Van de Velde SK**, Kassel D, Driscoll SJ, Gill TJ, Li G. To What Extent Does ACL Deficiency Alter Knee Motion during the Low-Impact Activity of Rising from a Chair? In: Trans ORS; Jan, 2011; Long Beach, CA.

Kozanek M, Hosseini A, **Van de Velde SK**, Moussa M, Rubash HE, Gill TJ, Li G. Medial versus Lateral Pivot of the Knee during Daily Weightbearing Activities. In: Trans ORS; Jan, 2011; Long Beach, CA.

Kozanek M, Hosseini A, **Van de Velde SK**, Driscoll SJ, Rubash HE, Gill TJ, Li G. Relationship of Knee Flexion and Motion in Secondary Degrees of Freedom during Daily Weightbearing Activities. In: Trans ORS; Jan, 2011; Long Beach, CA.

Hosseini, A, Kim CW, Lin L, Wang L, **Van de Velde SK**, Asnis PD, Li G. Contribution of the Anterolateral Ligament in Anterior Cruciate Ligament Deficiency and ACL Reconstruction. Poster presentation, 2016 ORS Annual Meeting, Orlando, FL.

Van de Velde SK, Kernkamp WA, Hosseini A, LaPrade RF, van Arkel E, Li G. In Vivo Elongation of the Anterolateral Ligament and Related Extra-Articular Reconstructions. Podium Presentation, 2016 ORS Annual Meeting, Orlando, FL.

Van de Velde SK, Kernkamp WA, Hosseini A, LaPrade RF, van Arkel E, Li G. In Vivo Elongation of the Anterolateral Ligament and Related Extra-Articular Reconstructions. Podium Presentation, 2016 ESSKA Annual Meeting, Barcelona, Spain.

