*Curriculum Vitae*

# *Hani Haider*

*B.Eng., Ph.D., C.Eng., M.I.Mech.E.*

- ***Winner of 12 international and academic prizes in orthopaedics research and engineering.***
- ***Professor in Orthopaedic Surgery Research and Director of Biomechanics, Implant Technology and Advanced Surgical Technology Laboratory***
- ***Ph.D. in Mechanical Engineering (England)***
- ***Internationally recognised expertise in Orthopaedic implant simulation and testing.***
- ***In the current position alone, led 72 industry, government and private sponsored research projects in Biomedical Engineering, with grants and contracts totalling over $9 million.***
- ***Consultant on implant testing methods, instrumentation and related technologies.***
- ***Author of over 250 publications and international conference presentations in orthopaedics technology research and engineering.***

## Honors & Awards

2015 Received the **"Leroy Wyman Award" by ASTM International** "to recognize the most honored engineer who has made outstanding contributions" to the work of the committee in testing standards for Orthopaedic devices.

2014 First recipient of the International Standards Organization ISO Committee **Chairman's Award** for "personal contributions to ISO TC 150 - Implants for Surgery - and International Standards Development". This prize was awarded in the ISO Annual meeting held in Seoul Korea in Sept 2014.

2013 Awarded an "**Honorary Lifetime Membership**" of the International Society for Technology in Arthroplasty (ISTA), for "outstanding contributions to technology in arthroplasty and to ISTA.

2010 Received the "**ASTM International Manny Horowitz Award"** which "recognizes the most honored committee member in the general interest category who has contributed to the standards development and/or related activities", ASTM Committee F04 is on Medical and Surgical Materials and Devices, May 2010.

2009 Recipient of the **Iraqi Academic Conference Award** given to four of the most distinguished academics of Iraqi origin in the United States, in recognition of accomplishments in Engineering. Presented at the Iraqi Academic Conference jointly hosted at the US National Academies and the Iraqi Cultural Office, Washington, DC. March 2009

2006 Received the ***Outstanding Professional Achievement*** award by the University of Nebraska Medical Center. (Only one of two faculty members in the year to be honored separately under both the "Special" and "Outstanding" categories.)

2006 Received the ***Special Professional Achievement*** award by the University of Nebraska Medical Center.

2005 Winner of the **"*Hap Paul Award*"** for the best research paper "… on new development in the field of orthopaedic arthroplasty", International Society for Technology in Arthroplasty, 18th Annual Symposium, Kyoto, Japan 2005.

2005 Received the **"*ASTM International Robert Fairer Award*"** bestowed by the American Society of Testing and Materials on Medical and Surgical Materials and Devices for "great contributions to the development of medical device and materials standards."

1987 Winner of ***"KLINGER International Research Prize"*** awarded for outstanding scientific work and contribution to related industries. International competition organised by the Klinger Group of companies and judged by the Austrian Research Centre, Siebersdorf.

1985 Winner of the ***"G.P. Smedley Prize in Mechanical Engineering"*** for best PhD research.

1983 Winner of the ***"Baker Prize in Engineering"*** for best university research project work.

1982 Winner of the ***"Mechanical Engineers Prize"*** awarded for best university results.

## Offices and professional memberships held

- Reviews Editor, Journal of Engineering in Medicine, IMechE Part H. (March 2012 till present)
- Biomedical Engineering Committee, The American Academy of Orthopaedic Surgeons (AAOS). Member, and Official Representative of the Orthopaedic Research Society. (Feb. 2011-2011)
- Basic Science Education Committee (BSEC), The Orthopaedic Research Society, Member (2011 till present)
- Director, Scientific Review and Information Technology, International Society of Technology in Arthroplasty (ISTA). (Sept. 2011 – present)
- Member of the Board of Directors, International Society of Technology in Arthroplasty (ISTA). (Sept. 2005 till present)
- Coordinator /Liaison Officer, Working Group 2 (Implant Wear), International Standards Organisation (ISO) , TC150 US Tag, (Nov.. 2013 – present).
- Technical (expert/coordinator), Friction of Hips Standard Writing Committee, Working Group/Item WK 28778, ASTM International, (Nov.. 2010 – present).
- Consultant, Biomedical Engineering Committee, The American Academy of Orthopaedic Surgeons (AAOS). (Feb. 2010 – March 2012).
- Program Director, International Society of Technology in Arthroplasty (ISTA). (March 2008 till Sept 2011)
- Chair, Ankle Replacement Testing Standards Committee, ASTM International (Nov. 2000 till present)
- Co-Chair, Knee Wear Testing Standards Committee, ASTM International. (Nov. 2002 till present)
- Co-Chair: Symposium on Mobile Bearing Total Knee Replacement Devices, Sponsored by ASTM Committee F04 Medical and Surgical Materials and Devices, St Louis, Mo. (May 2010)
- Editorial Board member, Journal of Engineering in Medicine, IMechE Part H. (Jan. 2009 till present)
- Editorial Board member, Journal, Advances in Orthopedics (June 2010 – present)
- Chair, Education Committee, 22 Annual Congress of (ISTA), Hawaii. (Oct. 2009)
- Chair, Expert Group revising knee wear testing standards, International Standards Organisation (ISO) (Oct. 2002 – till 2010)
- Member of the United States delegation to committee SC 150 (Medical Devices) of the International Standards Organisation. (2002 till present)
- Reviewer, Journal of Orthopaedic Research (Oct. 2007 till present)
- Reviewer, Journal of Clinical Orthopaedics and Related Research, CORR. (July 2010 till present)
- Reviewer for the Journal of Engineering in Medicine (Nov. 2007 till present)
- Reviewer of abstracts for the Orthopaedic Research Society (ORS) (2009 till present)
- Chairman/Coordinator, Biotechnology and Biomedical Engineering Committee, Iraqi American Academic and Professional Community Program, “Together for Iraq” project, Iraqi Cultural Center, Washington, DC. (Aug. 2009 till 2012)
- Associate Member Basic Science, American Academy of Orthopaedic Surgeons (AAOS) (2011 till present)
- Member of the Orthopaedic Research Society (ORS) (2000 till present)
- Chairman, Heartland Biomedical Engineering Symposium (April 2005).
- Member, organizing committee, Nebraska Biomedical Engineering Workshop. (2000 till present)
- Chartered Engineer - Member of the Engineering Council (UK). (May 1994 till present)
- Member of the Institution of Mechanical Engineers (I.Mech.E) (UK). (May 1994 till present)
- Member of the American Society of Testing and Materials (ASTM). (2000 till present)
- Member of the International Society of Technology in Arthroplasty (ISTA). (2000 till present)

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## Educational qualifications

1990 Ph.D.—University of Sheffield — Dept. Mechanical & Process Engineering. Sponsored by the "Ruston and Hornsby Scholarship in Mechanical Engineering".

Thesis title: "Internal Static and Dynamic Phenomena in Vortex Amplifiers".

1983 B.Eng. Honours MECHANICAL ENGINEERING Class II:1

The University of Sheffield, Department of Mechanical Engineering.

1980 GCE 'A' levels (Cambridge Board): Mathematics, Further Mathematics and Physics. Cambridgeshire College of Arts and Technology, Cambridge, England.

## Employment History

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| July 2008 — present | Professor, Director of Orthopaedics Biomechanics and Advanced Surgical Technologies Laboratory, Department of Orthopaedic Surgery & Rehabilitation, University of Nebraska Medical Center. |
| March 2000 — June 2008 | Associate Professor — Department of Orthopaedic Surgery & Rehabilitation, University of Nebraska Medical Center. |
| March 2002 — present | Adjunct Associate Professor – Department of Mechanical Engineering – University of Nebraska at Lincoln. |
| Feb. 1997— Feb 2000 | University Lecturer — Centre for Biomedical Engineering, University College London Medical School, Stanmore, England. |
| Feb. 1995—Feb. 1997 | Company Director and Consultant — Prosort Ltd. as Management and IT Consultants for Anglo-Swiss Maritime Co. Ltd., City —London. |
| Oct. 1990— Jan. 1995 | University Lecturer — Department of Mechanical & Process Engineering, University of Sheffield |
| and | Company Director and Consultant — Prosort Ltd. / Sheffield as consultants for various companies |
| Oct. 1988—Sept.1990 | Post-Doctoral Research Associate—Shell (Expro) & University of Sheffield. |

## Current University Committee Assignments

- Faculty member – Center for Advanced Surgical Technology (CAST) – University of Nebraska. Sept 2006 till present.
- Member of the Departmental Research Committee which quarterly reviews research projects of all 24 residents - Nov. 2007 till present.
- UNMC Departmental UneMed Faculty Advocate – representative to UneMed on intellectual property, patenting and licensing issues. Feb 2007 till present.
- Member of the MSIA Graduate Committee (Medical Sciences Interdepartmental Area) and Departmental coordinator for the (MSIA) PHD program – Jan. 2007 till present.

## Research Interests

**Prior to 1997 (Sheffield Univ., UK)**

Prior to Feb. 1997, my engineering specialty/research started with fluid technology and applications of Fluidics in the nuclear and oil industry. I successfully modelled and tested the statics and dynamics of Vortex Amplifiers for the United Kingdom Atomic Energy Authority (UKAEA) where we pioneered software developments for modelling, instrument control and automation. I then designed and built two large experimental test facilities for Shell/UK Exploration and Production and Shell KSEPL/Holland (budget >£300k). I became the Departmental Specialist on general computer interfacing and software development, and later moved to mechatronic applications for learning, medical, and manufacturing engineering. I consulted for a world-leading manufacturer of portable hole-drilling machines where I led a team to develop hardware and software for a micro-processor-driven feed system for their new hole drilling products, which featured expert-system automation & control. I also led a team to develop a software package for planning and simulation of orthopaedic surgery involving 2-D scanned x-rays and 3-D graphical bone models. This project sparked an interest in orthopaedic implant and surgical technology.

**Between 1997 and 2000 (UCL – London, UK)**

In University College London in Stanmore (1997-2000), reporting to Professor Peter Walker, I headed a task force responsible for the Design and production of the Stanmore Knee Simulator (which was later called the Instron-Stanmore Knee Simulator). I produced 13 machines in our laboratories and sold to leading knee testing labs in the USA and Europe and liaised later with the Instron Corporation who acquired a licence for the design. I also trained the biomedical engineers in all the labs who purchased this machine and many still use it. I was also the chief faculty-engineer in Stanmore for contract and government funded knee testing. One project involved a consortium of all the blue chip companies to develop the International Standards Organisation (ISO) test method for knee wear testing. Another project was sponsored by the UK Department of Health, with another consortium involving 59 short in-vitro simulator tests to investigate the kinematics of 8 different TKR designs and their sensitivity to surgical misalignment. Another project was the "Lifetime prediction tests for the fatigue performance of knee tibial trays" with a grant from the UK Government Department of Trade and Industry and a consortium of over 10 orthopaedics manufacturing companies. I also then started planning various research activities on minimally invasive surgery, computer-aided surgical planning and simulation and future robotic surgery. In 3 years I spent at Stanmore/ UCL, I have jointly with colleagues secured 5-6 different funding contracts and grants which exceeded £250,000 (> $400,000) in value.

**2000-Present (UNMC – Nebraska, USA)**

In my current faculty position, my research has involved three main themes:

1) Evaluation methods and standards for in-vitro testing of orthopaedic implants.
2) Development of innovative computer-aided surgical technologies. My team and I invented and pioneered the award winning innovations of navigated freehand bone cutting for joint replacement which have commanded international attention.
3) Innovative nano-technology surfaces for orthopaedic implants.

**In this position (in Nebraska) alone, I have received 72 research grants and contracts totaling over $9 million dollars. I am the Principal Investigator of 66 of these projects. They included two federal grants (>$4M), one charity and 69 contracts from industrial orthopedic companies (>$5M). Full details of every grant/contract can be made available upon request.**

## **Patents** (issued)

1. United States Patent #8560047, Method and Apparatus for Computer-Aided Surgery, issued October 15, 2013, to Hani Haider, Ph.D., and Osvaldo Andres Barrera, M.Sc. as inventors.

## **Patents** (applied for)

2. On-Board Tool Tracking System and Methods of Computer Assisted Surgery. International Patent Application Number: PCT/US14/29334. Hani Haider, PhD, Ibrahim Al-Shawi, PhD, and O. Andres Barrera, MSc as inventors.
3. Method and Apparatus for Computer Aided Orthopaedic Surgery
   USPTO Serial No: 60/814,370 File Date: 6/16/2006 UneMed #: 63254P (Provisional)
   Inventors: Hani Haider & O. Andres Barrera
4. Method and Apparatus for Computer Aided Surgery
   USPTO Serial No: 60/827,877 File Date 10/2/2006 UneMed #: 63254P2 (Provisional)
   Inventors: Hani Haider & O. Andres Barrera
5. Method and Apparatus for Computer Aided Surgery
   USPTO Serial No: 11/764,505 File Date 6/18/2007 UneMed #: 63254
   Inventors: Hani Haider & O. Andres Barrera
6. Method and Apparatus for Computer Aided Surgery
   USPTO Serial No: 11/927,429 File Date 10/29/2007 UneMed #: 63254.1
   Inventors: Hani Haider & O. Andres Barrera
7. Method and Apparatus for Computer Assisted Surgery Using Video Images
   USPTO Serial No: 61/048,945 File Date 4/29/2008 UneMed #: 08060P (Provisional)
   Inventors: Hani Haider & O. Andres Barrera
8. System for Computer Assisted Navigation and Control of a Power Tool
   USPTO Serial No: 61/501,489 File Date 6/27/2011 UneMed #: 11065P (Provisional)
   Inventors: Hani Haider, O. Andres Barrera & Ibrahim Al-Shawi.

## **Teaching and mentoring**

In the University of Sheffield (1990-1995) I had the heaviest teaching load among 30 or so engineering faculty of all levels within my dept., and came up top in student feedback ratings in various categories. In (1997-2000), I gave Biomechanics courses to the medical students of University College London, and supervised various researchers. In Nebraska, my didactic teaching role has been limited to 1-2 grand round lectures per year on biomechanics and implant technology to the orthopaedic surgery residents, invited lectures to the University's mechanical engineering department in Lincoln where I an adjunct faculty, and I also have been the mentor and supervisor of two MSc projects, and one PhD in my lab.

## **Interests and activities**

I play tennis twice a week on average, swim when I have time, and enjoy boating and jet skiing in the summer. I like watching good films, going to the theatre and listening to music especially classical, folk and traditional Arabic. I am an avid follower of international current affairs. I was a founding member and a participant in the 1983 British Expedition to the Sudan/Africa. As a team of six British graduates, we drove to Africa from Sheffield/England to the Sudan. We tested an intermediate-technology solar powered cooker which we designed with potential to reduce desertification in middle Africa due to wood burning as fuel for cooking.

# Appendix

## Dr. H. Haider — List of Publications

### Chapters in books

1. Eames, I.W., A.R. Johnson, T. Hobbs, H. Haider and I.C. Howard, "Computer Based Learning Developments in Mechanical Engineering at Sheffield University", Software for Engineering Education, Pub. CTI Centre for Engineering, Queen Mary and Westfield College, London Autumn 1993.

2. I.W. Eames, T. Hobbs, I.C. Howard, A.R. Johnson, and H. Haider, "The Energy Game: An Interactive Computer Aided Learning Package". Chapter in book "Alternative Approaches to Teaching Engineering", Volume 1, Ivan Moore and Kate Exley (Eds.), Pub. by Engineering Professors' Council with UCoSDA, 1994.

3. Blunn, G.W., Bell, C.J., Walker, P.S. Chaterjee, S., Perry, J., Cambell, P., Haider, H., and Paul, J.P., "Simulator Testing of Total Knee Replacements", Chapter 9 in: Friction, Lubrication and Wear of Artificial Joints, edited by I.M. Hutchings. Professional Engineering Publishing - 2003. ISBN 1 86058 363 6.

4. Haider, H, Walker, P, DesJardins, J, Blunn, G, "Effects of Patient and Surgical Alignment Variables on Kinematics in TKR Simulation Under Force-Control", Chapter 1, in Wear of Articulating Surfaces: Understanding Joint Simulation, Eds. Brown, Gilbertson and Good, ISBN: 0-8031-3415-0, ASTM International, PA, USA, Feb 2007.

5. Haider, H., Tribological Assessment of UHMWPE in the Knee, Chapter 26 in: Steven M. Kurtz, Ph.D., Editor, "UHMWPE Biomaterials Handbook" (Second Edition), Academic Press, 2009, pp 381-408.

### Articles published in peer reviewed scholarly journals

6. Boysan, F., Savas, D., Cardew, G., Haider, H, and Bullough, B., "Computer Experiments in the Fluids Laboratory", International Journal of Mechanical Engineering Education. Vol. 23, No. 1, pp. 31-40, Jan. 1995, Manchester University Press.

7. Beck, S.B.M., Haider, H., and Boucher R.F., "Transmission Line modelling of Simulated Drill Strings Undergoing Water Hammer", Journal of Mechanical Engineering Science, Issue C6, Vol 209, 1995, Mechanical Engineering Publications Ltd.

8. Aphornratana, S., Eames, I.W. and Haider, H., "A theoretical and experimental study of a small scale steam jet refrigerator", International Journal of Refrigeration, 18:6 or 18:7, Aug/September 1995, Elsevier Science Ltd.

9. Ahir, SP, Blunn, GW, Haider, H., Walker, PS, Browne, M and Gregson, PJ. "In kneed of testing" *Materials World*, Volume 6, No. 12, Dec. 1998.

10. Ahir, S.P., Blunn, G.W., Haider, H. and Walker, P.S. "Evaluation of testing method for the fatigue performance of total knee tibial trays." *Journal of Biomechanics*. Vol 32, 1999, 1049—1057.

11. Walker P S, Blunn GW, Perry J P, Bell C J, Sathasivam S, Andriacchi T P, Paul J P, Haider, H, Campbell P. "Methodology for long term wear testing of total knee replacements"*. Clinical Orthopaedics and Related Research, Number 372, pp. 290-301, March 2000*.

12. DesJardins JD, Walker PS, Haider, H. and Perry J. "The use of a force-controlled dynamic knee simulator to quantify the mechanical performance of total knee replacement designs during functional activity". *Journal of Biomechanics*, Vol. 33, No. 10, 1231-1242, Oct. 2000.

13. Walker, PS, Haider, H, "Characterizing the Motion of Total Knee Replacements in Laboratory Tests", Journal of Clinical Orthopaedics and Related Research, Vol. 410, pp. 54-68, May 2003.

14. Verner L, Oleynikov D, Holtmann S, Haider H, Zhukov L., "Measurements of the level of surgical expertise using flight path analysis from da Vinci robotic surgical system", J. Studies in health technology and informatics", 2003; 94:373-8.

15. Haider, H and Walker, PS, "Measurements of Constraint of Total Knee Replacement", Journal of Biomechanics, Vol. 38, Iss. 2, pp341-348, Feb 2005.

16. Platt, S.R., Farritor, S, Garvin K. and Haider, H., "On Low Frequency Electric Power Generation with PZT", MT03-101R, IEEE/ASME, Journal of Transactions on Mechatronics, pp 240-252, Vol. 10, No. 2, April 2005.

17. Platt, S.R., Farritor, S., Garvin, K. and Haider, H., "The Use of Piezoelectric Ceramics for Electric Power Generation Within Orthopedic Implants"; IEEE/ASME Journal of Transactions on Mechatronics, vol. 10, no. 4, pp. 455-461, August 2005.

18. Haider H., Walker P., DesJardins J., Blunn G., "Effects of Patient and Surgical Alignment Variables on Kinematics in TKR Simulation Under Force-Control", Journal of ASTM International (JAI), Volume 3, Issue 10, pp. 3-14, Nov./Dec. 2006.

19. Namavar, F., Jackson, J.D. , Sharp, J.G., Varma, S., Haider, H., Feschuk, C. and Garvin, K.L., "Novel Engineered Nanocrystalline Ultra-Hydrophilic Hard Ceramic Coatings for Attachment and Growth of Bone Marrow Stromal Cells", J. Molecular & Cellular Biomechanics, Vol. 3, No. 4, p.p. 171-172, 2006.

20. Tarkin IS, Mormino MA, Clare MP, Haider H, Walling AK, Sanders RW: "Anterior Plate Supplementation Increases Ankle Arthrodesis Construct Rigidity", J. Foot Ankle Int., Vol. 28, No. 2, p.p. 219-23. 2007.

21. Namavar, F.; Jackson, J.D.; Sharp, J.G.; Mann, E.E.; Bayles, K.; Cheung, C.L.; Feschuk, C.; Varma, S.; Haider, H.; Garvin, K.L., "Searching for Smart Durable Coatings to Promote Bone Marrow Stromal Cell Growth While Preventing Biofilm Formation", Published proceedings of Mater. Res. Soc. Symp., Paper 0954-H04-04, Vol. 954, 2007.

22. Knight, L.A., Pal, S., Coleman, J.C., Bronson, F, Haider, H., Levine, D.L., Taylor, M., Rullkoetter, P.J., "Comparison of long-term numerical and experimental total knee replacement wear during simulated gait loading", Journal of Biomechanics, Vol. 40, No. 7, pp. 1550-1558, 2007.

23. Haider, H., Barrera, O.A., Garvin, KL, "Minimally invasive TKR surgery through navigated freehand bone cutting: Winner of the 2005 "HAP" PAUL AWARD", Journal of Arthroplasty, Vol. 22, Issue 4, pp. 535-542, June 2007.

24. Namavar, F., Wang, G., Cheung, C.L., Sabirianov, R.F., Zeng, X.C., Mei, W.N. Bai, J., Brewer, J.R., Haider, H. and Garvin, K.L., "Thermal stability of nanostructurally stabilized zirconium oxide", J. Nanotechnology, Volume 18, Number 41, 415702 (6pp), Oct. 2007.

25. Pal, S., Haider, H., Laz. P., Knight, L.A., Rullkoetter, P.J., "Probabilistic Computational Modeling of Total Knee Replacement Wear", J. Wear, Vol. 264, 2008, pp. 701–707.

26. Barrera, O.A., Haider, H. and Garvin, K.L., "Towards a standard in assessment of bone cutting for Total Knee Replacement", Proc. IMechE, Part H: J. Engineering Medicine, 2008, 222(H1), 63-74.

27. Wang, G.; Brewer, J. R.; Namavar, F.; Sabirianov, R. F.; Haider, H.; Garvin, K. L.; Cheung, C. L., "Structural study of titanium oxide films synthesized by ion beam assisted deposition", J. Scanning, Vol.. 30, pp. 59–64, 2008.

28. Namavar,F., Cheung, C.L., Sabirianov, R.F., Mei, W.N., Zeng, X.C., Wang, G., Haider, H., and Garvin, K.L., "Lotus Effect in Engineered Zirconia", J. Nano Letters, 2008, Vol. 8, No. 4, pp. 988-996.

29. Haider H, Garvin K. Rotating Platform versus Fixed-bearing Total Knees - An in Vitro Study of Wear. J. Clinical Orthop. Relat. Res., 2008; Vol. 466, pp. 2677-2685.

30. Soo, Y.L., Chen, P.J., Huang, S.H., Shiu, T.J., Tsai, T.Y., Chow, Y.H., Lin, Y.C., Weng, S.C., Chang, S.L., Wang, G., Cheung, C.L., Sabirianov, R.F., Mei, W.N., Namavar, F. Haider, H., Garvin, K.L. Lee, J.F., Lee, H.Y., and Chu, P.P., "Local structures surrounding Zr in nanostructurally stabilized cubic zirconia: Structural origin of phase stability", J. Appl. Phys. 104, 113535 (2008).

31. Lian J., Zhang J., Namavar F., Zhang Y., Lu F., Haider H., Garvin K., Weber W.J., Ewing R.C., "Ion beam-induced amorphous-to-tetragonal phase transformation and grain growth of nanocrystalline zirconia", Nanotechnology. 2009 Jun 17;20(24):245303.

32. Sutton, L.G., Werner, F.W., Haider, H., Hamblin, T., and Clabeaux, J.J., "In vitro response of the natural cadaver knee to the loading profiles specified in a standard for knee implant wear testing", Journal of Biomechanics, Vol. 43, Issue 11, Aug. 2010, pp. 2203–2207.

33. Haider H., Weisenburger J., Kurtz S.M.,, Rimnac C.M., Freedman J., Schroeder D.W., Garvin K.L., "Does Vitamin E-Stabilized Ultrahigh-Molecular-Weight Polyethylene Address Concerns of Cross-Linked Polyethylene in total Knee Arthroplasty?", Journal of Arthroplasty, Volume 27, No 3, Mar 2012, pp. 461-469.

34. Zhang, J.; Lian, J.; Namavar, F.; Wang, J.; Haider, H.; Garvin, K.; and Ewing, R. C.: Nanosized rutile (TiO2) thin film upon ion irradiation and thermal annealing. Journal of Physical Chemistry C, 115(46): 22755-22760, DOI: 10.1021/jp2056283, October 2011.

35. Walker P.S., Haider H., "Standard Testing Methods for Mobile Bearing Knees", Journal of ASTM International (JAI), Volume 9, No. 2, February, 2012.

36. Haider H., Kaddick C., "Wear of Mobile Bearing Knees: Is It Necessarily Less?", Journal of ASTM International (JAI). Volume 9, No. 2, Feb. 2012.

37. Garvin, K.; Barrera, A.; Mahoney, C.; Hartman, C.; and Haider, H.: "Total Knee Arthroplasty with a Computer-navigated Saw - A Pilot Study". J. Clin Orthop Relat Res, Symposium: Papers Presented at the Annual Meetings of the Knee Society (ISSN 0009-921X), 10.1007/s11999-012-2521-2, September 2012.

38. Dusad, A, Chakkalakal, D.A., Namavar, F., Haider, H., Hanisch, H, Duryee, M.J., Diaz, A., Rensch, A., Zhang, Y., Hess, R., Thiele, G.M., Fehringer. E.V., "Titanium implant with nanostructured zirconia surface promotes maturation of peri-implant bone in osseointegration", Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine. 227 : 510-22. 2013.

39. Kenneth L. Urish; Peter W. DeMuth; David W. Craft; Hani Haider; Charles M. Davis III. Pulse Lavage is Inadequate at Removal of Biofilm from the Surface of Total Knee Arthroplasty Materials. Journal of Arthroplasty, 29(6):1128-32, June 2014.

40. Baykal, D., Siskey, R.S., Haider, H., Saikko, V., Ahlroos, T. and Kurtz, S.M. "Advances in tribological testing of artificial joint biomaterials using multidirectional pin-on-disk testers", Journal of the Mechanical Behavior of biomedical materials; Vol. 31C, pp. 117–134, March 2014.

41. Sanders, A.P., Lockard, C.A., Weisenburger, J.N., Haider, H., Raeymaekers, B. "Using a surrogate contact pair to evaluate polyethylene wear in prosthetic knee joints", Journal of Biomedical Materials Research B: Applied Biomaterials, 2015 Vol. 00b, DOI: 10.1002/jbm.b.33360.

**Invited articles in Professional Journals or Circulars**

42. Haider, H., Ponnusamy, K.E., Giori, N.J, Anderson, P.A., Nassr, A., "One Layer at a Time: Rapid Prototyping in Orthopaedics What's the state of the art in orthopaedic 3D printing?", AAOS Now, April, 2015 Issue, http://www.aaos.org/ news/aaosnow/apr15/ research1.asp.

43. Ponnusamy, K.E., Haider, H., Anderson, P.A., Nassr, A., Giori, N.J, "Customizing Patient Care with Rapid Prototyping. Instruments, implants, and more from 3D printing", AAOS Now, June, 2015 Issue, http://www.aaos.org/ news/aaosnow/jun15/research11.asp.

**Research papers and abstracts in peer-reviewed <u>international</u> conferences & proceedings**

44. Boucher, R.F., Boysan, F. and Haider, M.H.S., "Theoretical Computer Simulations of Swirling Flow in a Vortex Amplifier Chamber", Paper N:2, pp. 370-374, Volume of papers presented at the 2nd. International Symposium on Fluid Control, Measurement, Mechanics and Flow Visualisation (Flucome '88), Sheffield, U.K., September, 1988.

45. Haider, M.H.S. and Boucher, R.F., "Towards a steady-state model for the Vortex Amplifier', Volume of papers presented at the American Society of Mechanical Engineers (ASME), 3rd. International Symposium on Fluid Control, Measurement, Mechanics and Flow Visualisation (Flucome '91), San Francisco, USA, Aug. 1991.

46. Haider, M.H.S. and Boucher, R.F., "Structures for algorithms for automating LDA measurements", Proceedings of the Fifth International Conference, Laser Anemometry - Advances and Applications, Koningshof, Veldhoven, The Netherlands, Aug. 1993.

47. Beck, S.B.M., Boucher, R.F. and Haider, H., "Modelling Water Hammer with Transmission Line Techniques", Proc. 1994 IChemE Research Event, Vol. 2, Jan. 1994, London.

48. Haider, H., Johnson, A.R., Hobbs, T.S. and Eames, I.W., "A Computer Aided Learning Tool to Teach Gyroscopic Motion", pp 161-168, Proceedings of *Hypermedia in Vaasa '94*, Conference on Computers and Hypermedia in Engineering Education, ISBN 951-96789-1-3, June 1994, Vaasa, Finland.

49. Eames, I.W., Hobbs, T.S., Johnson, A.R., and Haider, H., "The Development of an Innovative CAL Package: 'The Energy Game' ", pp 123-127, Proceedings of *Hypermedia in Vaasa '94*, Conference on Computers and Hypermedia in Engineering Education, ISBN 951-96789-1-3, June 1994, Vaasa, Finland.

50. Tippetts, J.R. and Haider, H., "Analysis and Optimisation of a Fluidic Hydraulic Ram", Proceedings of the Fourth International Symposium on Fluid Control, Measurement and Visualisation, Toulouse, France, Aug. 1994.

51. Kamala, M.A., Boucher, R.F. and Haider, H., “Integration of AutoCad with Laser Doppler Anemometry (LDA)”, Proceedings of EALA/ASME International Conference, Laser Anemometry - Advances and Applications, South Carolina, USA Aug. 1995.

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152. Haider, H., Croson, R., Garvin, K., "Is wear truly lower and is it the main benefit of rotating platform mobile bearing total knees?", Poster 2000, Transactions of the 54th Annual Meeting of the Orthopaedic Research Society, San Francisco, March 2008.

153. Weisenburger, J.N., Naylor, M.G., Schroeder, D.W., White, B.F., Unsworth, A., Garvin, K.L. and Haider, H., "On-line measurement of friction of Total Hip Replacement systems during multi-station hip wear testing", Poster 1791, Transactions of the 54th Annual Meeting of the Orthopaedic Research Society, San Francisco, March 2008.

154. Haider, H., Weisenburger, J.N., Naylor, M.G., Schroeder, D.W., Croson, R.E., Garvin, K.L., "Bearing diameter, radial clearance and their effect on wear in ceramic-on-metal total hip replacements", Poster 1792, Transactions of the 54th Annual Meeting of the Orthopaedic Research Society, San Francisco, March 2008.

155. Haider, H. Barrera O.A., Mahoney, C.R., Ranawat, C.S., Ranawat, A.S., Croson, R.E., Garvin, K.L., "Experience with navigated freehand bone cutting for total knee replacement surgery", Poster 1997, Transactions of the 54th Annual Meeting of the Orthopaedic Research Society, San Francisco, March 2008.

156. Weisenburger, J.N., Croson, R.E., Namavar, F., Garvin, K.L., Haider, H., "Concern with adhesion and wear of a Titanium Niobium Nitride coating on Total Knee Replacements for metal sensitive patients", Poster 2007, Transactions of the 54th Annual Meeting of the Orthopaedic Research Society, San Francisco, March 2008.

157. Namavar, F., Jackson, J.D., Sharp, J.G., Haider, H., Garvin, K.L., "Nanostructurally Stabilized Zirconia versus Hydroxyapatite", Poster 1700, Transactions of the 54th Annual Meeting of the Orthopaedic Research Society, San Francisco, March 2008.

158. Haider, H., Barrera O.A, Mahoney, C.R., Ranawat, A.S., Ranawat, C.S., Garvin, K.L., "Navigated freehand bone cutting for TKR surgery: Experiments with seven Independent surgeons", P196, Proceedings of the 75th Annual Meeting of the American Academy of Orthopaedic Surgeons AAOS, San Francisco, March 2008.

159. Haider, H., Weisenburger, J.N., Naylor, M.G., Schroeder, D.W., Croson, R.E., O'Brien B.W., Garvin, K.L., "Effect of bearing diameter and radial clearance on wear of ceramic-on-metal total hip replacements", P109, Proceedings of the 75th Annual Meeting of the American Academy of Orthopaedic Surgeons AAOS, San Francisco, March 2008.

160. Garvin, K.L., Haider, H., "A Comparison of the Rotating Platform and Fixed Bearing PFC Σ Total Knees: An in vitro Study of Kinematics and Wear", The Knee Society, Proceedings of the 24th Annual Interim Meeting, Italy, 2007.

161. Haider, H., Weisenburger, J.N., Kurtz, S.M., Freedman, J., Schroeder, D.W., Garvin, K.L., "Can Vitamin E Impregnation address concerns of Highly-Cross-Linked UHMWPE in TKR?", Invited podium paper, Proceedings of the 21st Annual Congress of the International Society for Technology in Arthroplasty, Seoul, Korea, October, 2008.

162. Haider, H., Weisenburger, J.N., Kurtz, S.M., Rimnac, C.M., Freedman, J., Schroeder, D.W., Garvin, K.L. "Does Vitamin E Stabilized UHMWPE Address Concerns of Cross Linked Polyethylene in TKA?", The Knee Society, Proceedings of the 25th Annual Interim Meeting, Denver, 2008.

163. Xia R., Haider H., "Quantitative relationship between bradykinesia and rigidity in Parkinson's disease.", Society for Neuroscience, paper 272.7/II6, Washington, DC, Nov. 2008.

164. Hartman, C., Haider, H., Branting, N., Mormino, M., Fehringer, E., "Unicortical locking screws provide comparable rigidity to standard screws in clavicle fixation", Poster 1536, 55th Annual Meeting of the Orthopaedic Research Society, February 2009, Las Vegas.

165. Angibaud, L., Steffens, J., Rundell, S., Hayes, A., Weisenburger, J., Haider, H., "Effects of Tibial Insert Slope on Polyethylene Wear and Stress", Poster 2391, 55th Annual Meeting of the Orthopaedic Research Society, February 2009, Las Vegas.

166. Haider, H., Weisenburger, J.N., Kurtz, S.M., Rimnac, C.M., Freedman, J., Schroeder, D.W., Garvin, K.L., "Highly crosslinked UHMWPE in TKA - Does Vitamin-E-stabilized polyethylene address our concerns?", Poster 2328, 55th Annual Meeting of the Orthopaedic Research Society, February 2009, Las Vegas.

167. Lian, J., Zhang, J., Namavar, J., Haider, H., Garvin, K., Ewing, R., "Phase Stability of Nanostructurally-Stabilized Pure Cubic ZrO2 under Ion Beam Irradiation", Proceedings of the Symposium Microstructural Processes in Irradiated Materials, The Minerals, Metals and Materials Society (TMS) Annual Meeting and Exhibition, San Francisco, Feb. 2009.

168. Hartman, C., Haider, H., Branting, N., Mormino, M., Fehringer, E., "Unicortical locking screws provide comparable rigidity to standard screws in clavicle fixation", Mid-America Orthopaedic Association Annual Meeting, Amelia Island, FL, April 2009.

169. Haider, H., Invited Lecture, "Biomechanische Zusammenhänge bei Hüftimplantaten (Biomechanical considerations of Total Hip Replacement)", Interdisziplinäres symposium, Das Hüftimpingement Ursache, Diagnose und Therapie (Interdisciplinary Symposium of causes, diagnoses and therapies of Hip Impingement), Orthopädie und Sportmedizin Linz / Rhein, Königswinter, Germany, 9 May 2009.

170. Haider, H., Invited guest speaker, "Topical engineering considerations of modern Total Hip Replacement systems", Symposium on Cobalt-based Alloys for Biomedical Applications, organized by the Iwate Industry Promotion Center and MEXT (Ministry of Education, Culture, Sports, Science and Technology) of Japan, 4 Sep. 2009, Marioka, Japan.

171. Haider, H., “Hard-on-hard bearing couples for Total Hip Replacement systems”, Invited Lecture given at Japanese Medical Materials, Osaka, Japan. 11 Sept. 2009.

172. Namavar, F.; Sabirianov, R.; Jackson, J.; Sharp, J.; Gustafson, T.; Namavar, R.; Haider, H.; Fehringer, E.; and Garvin, K.: “Biocompatibility of Engineered Nanostructures: Does Electrostatic and Steric Complementarity Between Designer Surface and Cells Enhance Adhesion and Growth?”, 12th Seminar and Meeting on: Surface-Reactive Biomaterials with Cells and Tissues, Faenza, Italy, May 2009.

173. Haider, H., Barrera, O. A. and Garvin, K. L., “Smart-saw for navigated freehand bone cutting for TKR: Putting full control of the CAOS system in the hands of the surgeon”, Podium paper, Proceedings of the 22nd Annual Congress of the International Society for Technology in Arthroplasty (ISTA). Hawaii, USA, October 22-14, 2009.

174. Barrera, O. A., Garvin, K. L. and Haider, H., “Comparing manual dexterity between different ortho residents”, Podium paper, Proceedings of the 22nd Annual Congress of the International Society for Technology in Arthroplasty (ISTA). Hawaii, USA, October 22-14, 2009.

175. Barrera, O. A., Menghini, M. J., Garvin, K. L. and Haider, H., “Introduction of a navigated bone ink-jet marker to improve surgical plan transfer and cutting speed”, Poster, Proceedings of the 22nd Annual Congress of the International Society for Technology in Arthroplasty (ISTA). Hawaii, USA, October 22-14, 2009.

176. Haider, H., Weisenburger, J.N., and Garvin, K.L., “Effect of bearing material and size on total hip replacements: Comparison of 14 different designs under the same testing conditions”, Podium paper, Proceedings of the 22nd Annual Congress of the International Society for Technology in Arthroplasty (ISTA). Hawaii, USA, October 22-14, 2009.

177. Garvin, K. L., Barrera, O.A. and Haider, H., “Navigation in TKA: Arguments (not) for the use of navigation”, Podium paper, Proceedings of the 22nd Annual Congress of the International Society for Technology in Arthroplasty (ISTA). Hawaii, USA, October 22-14, 2009.

178. Weisenburger, J.N., Hovendick, S.M., Garvin, K.L. and Haider, H., “How durable are titanium nitride coatings on total hip replacements?”, Podium paper, Proceedings of the 22nd Annual Congress of the International Society for Technology in Arthroplasty (ISTA). Hawaii, USA, October 22-14, 2009.

179. Weisenburger, J.N., Naylor, M.G., Schroeder, D.W., White, B.F., Unsworth, A., Garvin, K.L., Haider, H., “Correlation of friction measurements with wear characteristics during multi-station hip simulator wear tests”, Podium paper, Proceedings of the 22nd Annual Congress of the International Society for Technology in Arthroplasty (ISTA). Hawaii, USA, October 22-14, 2009.

180. Haider, H., Weisenburger, J.N., Sherman, S., Karnes, J., Garvin, K.L., “Fatigue and wear evaluation of partial femoral and tibial unicompartmental cartilage replacement knee components”, Poster, Proceedings of the 22nd Annual Congress of the International Society for Technology in Arthroplasty (ISTA). Hawaii, USA, October 22-14, 2009.

181. Weisenburger, J.N., Hovendick, S.M., Garvin, K.L. and Haider, H., “Could the metallic head as well as the uhmwpe bearing liner wear in total hip replacements?”, Poster, Proceedings of the 22nd Annual Congress of the International Society for Technology in Arthroplasty (ISTA). Hawaii, USA, October 22-14, 2009.

182. Namavar, F., Sabirianov, R., Jackson, J.D., Namavar, R., Sharp, J.G., Garvin, K.L. and Haider, H., "Designing biocompatibility of nanostructures for joint replacement implants", Podium paper, Proceedings of the 22nd Annual Congress of the International Society for Technology in Arthroplasty (ISTA). Hawaii, USA, October 22-14, 2009.

183. Jacobberger, R.M., Namavar, F., Garvin, K.L., and Haider, H., "Long-term hydrophilic properties of engineered zirconia surfaces for orthopaedic implants", Podium paper, Proceedings of the 22nd Annual Congress of the International Society for Technology in Arthroplasty (ISTA). Hawaii, USA, October 22-14, 2009.

184. Angibaud, L.D., Stulberg, B., Mabrey, J., Covall, D., Steffens, J., Hayes, A., Weisenburger, J., Haider, H., "Effects of tibial insert slope on polyethylene wear", Proceedings of the 22nd Annual Congress of the International Society for Technology in Arthroplasty (ISTA). Hawaii, USA, October 22-14, 2009.

185. Weisenburger, J, Haider, H., Garvin, K., "Coating Dissociation Risks with Titanium Nitride Coated Total Hip Replacement Systems", Poster 2210, 56th Annual Meeting of the Orthopaedic Research Society (ORS), New Orleans, March 2010.

186. Haider, H., Weisenburger, J., Garvin, K., "Anatomical Hip Simulator Wear Results of 14 Different Contemporary THR Designs and Materials", Poster 2323, 56th Annual Meeting of the Orthopaedic Research Society (ORS), New Orleans, March 2010.

187. Haider, H., Barrera, O.A., Garvin, K., "Novel Method for Quantitative Assessment and Quality Management of Bone Preparation for Total Knee Replacement", Poster 2066, 56th Annual Meeting of the Orthopaedic Research Society (ORS), New Orleans, March 2010.

188. Haider, H., Weisenburger, J., Garvin, K., "Metal-on-Plastic Total Hip Replacements: Does the Femoral Head Wear?", P109, Proceedings of the 77th Annual Meeting of the American Academy of Orthopaedic Surgeons (AAOS), New Orleans, March 2010.

189. Haider, H., Weisenburger, J., Garvin, K., "Concern with Titanium Nitride Coated Total Joint Replacement Components", P110, Proceedings of the 77th Annual Meeting of the American Academy of Orthopaedic Surgeons (AAOS), New Orleans, March 2010.

190. Haider, H. and Kaddick, C., "Wear of mobile bearing knees: Is it necessarily less?", Symposium on Mobile Bearing Total Knee Replacement Devices, Proceedings of the Symposium on Mobile Bearing Total Knee Replacement Devices, Sponsored by ASTM Committee F04 Medical and Surgical Materials and Devices, St Louis, Mo., May 2010.

191. Haider, H., Weisenburger, J.N., Naylor, M.G., Schroeder, D.W., White, B.F. and Garvin, K.L., "Friction of Various Hip Replacement Materials and Designs Captured During Testing on Hip Simulators", Proceedings of the 23rd Annual Congress of the International Society for Technology in Arthroplasty (ISTA). Dubai, UAE, October 6-9, 2010.

192. Haider, H. and Kaddick, C., "Should a Mobile Bearing Wear Less than a Fixed-Bearing TKR? The Answer from in Vitro Wear Testing", Proceedings of the 23rd Annual Congress of the International Society for Technology in Arthroplasty (ISTA). Dubai, UAE, October 6-9, 2010.

193. Haider, H., Weisenburger, J.N., Sherman, S, Karnes, J., and Garvin, K.L., "Fatigue and Wear Evaluation of Partial Femoral and Tibial Unicompartmental Cartilage Replacement Knee Components", Proceedings of the 23rd Annual Congress of the International Society for Technology in Arthroplasty (ISTA). Dubai, UAE, October 6-9, 2010.

194. Grimes, J.B., Haider, H., Weisenburger, J.N., Langton, D.J., Joyce, T.J., "Negative Net Clearance of Large Diameter Metal-Metal Bearings is Associated with Clinical Failures", Poster 1210, 57th Annual Meeting of the Orthopaedic Research Society (ORS), Long Beach, CA, Jan. 2011.

195. Samuelson, E.M., Haider, H., Carlson, T., Hatzidakis, A.M., Ratron, Y.A., Fehringer, E.V., "Angular Stable Intramedullary Nail Versus Locking Plate Fixation of Osteoporotic Surgical Neck Proximal Humerus Fractures: A Biomechanical Comparison", Poster 1519, 57th Annual Meeting of the Orthopaedic Research Society (ORS), Long Beach, CA, Jan. 2011.

196. Muthumani A., Powell D., Haider H., Threlkeld A., Xia R., "Relationship Between Movement Speed and Regularity of Movement in Parkinson's Disease", Paper 303, 35th Annual Meeting, American Society of Biomechanics, Long Beach, CA, August, 2011.

197. Garvin KL, Al Shawi I, Barrera OA, Mahoney C, Hartman CW, Haider H. "Could a smart navigated arthroplasty bone cutting instrument improve navigation?" Annual closed meeting of the Knee Society; 2011 Sep 15-17. London, Ontario, Canada.

198. Weisenburger J.N., Garvin K.L., Haider H., "Femoral Head Wear in Metal-on-Plastic Total Hip Replacements of Several Designs", 24th Annual Congress of the International Society for Technology in Arthroplasty (ISTA). Bruges, Belgium, September 20-23, 2011.

199. Weisenburger J.N., Garvin K.L., Haider H., "More Than One Type of Vitamin E Stabilized Highly Crosslinked UHMWPE Greatly Reduces Wear in TKA", 24th Annual Congress of the International Society for Technology in Arthroplasty (ISTA). Bruges, Belgium, September 20-23, 2011.

200. Barrera O.A., Al-Shawi I., Garvin K.L,, Haider H., "Smart-instruments for Navigated Freehand Bone Cutting – Hands Free Automatic Laser Bone Marking: On-tool Marker (OTM) ", 24th Annual Congress of the International Society for Technology in Arthroplasty (ISTA). Bruges, Belgium, September 20-23, 2011.

201. Haider H., Barrera O.A., Hartman C.W., Garvin K.L., "Can the Future Bring TKR Without Implant Specific Instruments?", 24th Annual Congress of the International Society for Technology in Arthroplasty (ISTA). Bruges, Belgium, September 20-23, 2011.

202. Garvin K.L., Haider H., "Using Highly Cross-linked Polyethylene in Total Joint Arthroplasty: The Argument Against", 2012 AAOS Annual Meeting. San Francisco, CA, February 7-11, 2012.

203. Dusad A., Chakkalakal D., Namavar F., Haider H., Thiele G., Hanisch M., Duryee A., Diaz A., Rensch A., Zhang Y., Hess R., Fehringer E. "Nanomaterial – Coated Implants for Joint Replacements in Elderly Patients", Poster 1967, 2012 AAOS Annual Meeting, San Francisco, CA, February 7-11, 2012.

204. Weisenburger J., Haider H., Naylor M., Schroeder D., White B., Unsworth A., Garvin K., "Friction of a Variety of Total Hip Replacements", Poster 2074, 2012 AAOS Annual Meeting, San Francisco, CA, February 7-11, 2012.

205. Namavar F; Sabirianov RF; Rubinstein A; Thiele GM; Koepsell LA; Sharp JG; Namavar RM; Haider H; Garvin KL. "Nanoengineering of implant surfaces for enhanced biointegration", TMS Annual Meeting and Exhibition; March 11-15 ; Orlando, FL. 2012.

206. Barrera, O.A., Hartman, C.W., Garvin, K.L., Growney, T.M. and Haider, H., "Complete TKR Surgery Experiments on Cadavers Confirm Feasibility of Navigated Freehand Cutting (NFC)", 25th Annual Congress of the International Society for Technology in Arthroplasty (ISTA), Sydney, Australia, Oct. 3-6, 2012.

207. Urish K.L., Demuth P., Bent M., Haider H., Craft D.W., Davis C.M., "Pulse Lavage is Inadequate at Removal of Biofilm from the Surface in TKA Components", American Association of Hip and Knee Surgeons (AAHKS), Proc. 22nd Annual Meeting, Dallas, Nov. 2-4, 2012.

208. Haider, H., "Are Current Knee Test Methods Effective for the "Typical" Patient, and are they Applicable to the Highly Active or Obese Patient?", Invited Talk, Workshop 4 Obesity and Biomechanics, 2013 Annual Meeting of the Orthopaedic Research Society (ORS), San Antonio, Texas.

209. Siskey, R., Kurtz, S.M., Kyomoto, M., Ueno, M., Weisenburger, J.S. and Haider, H., "In Vitro Wear Performance of MPC-grafted UHWMPE for Total Hip Replacement", Paper 1785, Vol. 38, Transactions of the Orthopaedic Research Society (ORS), San Antonio, Texas, March 2013.

210. Mihalko, W. M., Haider, H., Potty, A.G., Saleh, K.J., "Risks and Benefits of Alternate Bearing Use in Total Knee Arthroplasty", Scientific Exhibit Paper, Proceedings of the 80th Annual Meeting of the American Academy of Orthopaedic Surgeons (AAOS), Chicago, IL, March 2013.

211. Urish, K., Demuth, P., Haider, H., Craft, D.W., Davis, C.M., "Pulse Lavage is Inadequate at Removal of Biofilm from the Surface of TKA Components", Poster P171, Proceedings of the 80th Annual Meeting of the American Academy of Orthopaedic Surgeons (AAOS), Chicago, IL, March 2013.

212. Haider H. and Weisenburger J., "A method for wear testing of reverse shoulder arthroplasty systems", 26th International Society for Technology in Arthroplasty (ISTA) Annual Congress 2013; Palm Beach, FL. Oct. 2013.

213. Weisenburger J; Garvin K; Haider H. "A novel method to produce scratches on metallic orthopaedic implants similar to those seen on retrievals", 26th International Society for Technology in Arthroplasty (ISTA) Annual Congress 2013; Palm Beach, FL. Oct . 2013.

214. Weisenburger J., Garvin K.L. and Haider H. "Friction factors of various metal on plastic hip replacement designs with scratched femoral heads captured during testing on a multi-station hip simulator", 26th International Society for Technology in Arthroplasty (ISTA) Annual Congress 2013; Palm Beach, FL. Oct. 2013.

215. Haider, H., "Ushering the era of non-implant specific instruments for knee arthroplasty", Invited Speaker, 26th International Society for Technology in Arthroplasty (ISTA) Annual Congress 2013; Palm Beach, FL. Oct. 2013.

216. Weisenburger J., Haider, H., and Garvin K.L., "Friction factors of various metal on plastic hip replacement designs with intentionally scratched femoral heads captured during testing on a multi-station hip simulator. 2014 ORS Annual Meeting; New Orleans, LA. March. 2014.

217. Garvin KL, and Haider H, "Alignment: How do we get it right? Conventional instruments: The gold standard", The Knee Society 2014 Annual Meeting at the American Academy of Orthopaedic Surgeons (AAOS) Specialty Day Meeting. New Orleans, LA, March 15, 2014.

218. Throckmorton, T., Sperling, J.W. and Haider, H., Throckmorton T; Sperling J; Haider H. Paper 447, Wear characteristics of vitamin E-infused polyethylene in a reverse shoulder arthroplasty. 2014 AAOS Annual Meeting; New Orleans, LA. 2014 March.

219. Sykes J; Haider H; Sperling J; Throckmorton T. Wear Characteristics of Vitamin E-Infused Polyethylene in a Reverse Shoulder Arthroplasty. Mid-America Orthopaedic Association Annual Meeting; San Antonio, TX. April 23-27, 2014.

220. Haider, H., "Femoral Component Coatings – A Solution for Allergic Patients?", Invited podium paper, European Federation of Orthopaedics and Traumatology (EFORT) 15th Congress. London, England. June 4, 2014.

221. Haider, H., Al-Shawi, I.M., Barrera, O.A., Pinto, A.F., Shaya, K., Weisenburger, J.N., Garvin, K.L. "On-Tool Tracking (OTT) System for Navigated Freehand Cutting (NFC)", Invited Talk, 27th International Society for Technology in Arthroplasty (ISTA) Annual Congress, Kyoto, Japan 2014.

222. Haider, H., "Optimization of TKA", Invited keynote lecture for an in-conference symposium titled: Optimization of TKA for Asian Patients, 27th International Society for Technology in Arthroplasty (ISTA) Annual Congress, Kyoto, Japan 2014.

223. Urish KL, Demuth PW, Kwan BW, Haider, H. Craft DW, Wood TK, Davis CM. Biofilm persister population activation: A potential new adjunct therapy to periprosthetic joint infection. American Academy of Hip and Knee Surgeons (AAHKS). November 2014, Dallas, TX.

224. Haider, H., "Evaluating new designs: Preclinical evaluation, ISO and ASTM testing methods and standards", Invited Keynote Lecture, Chinese Orthopaedic Association Annual Meeting, Beijing, China, November, 2014.

225. Haider, H., "Precision Orthopaedic Surgery without Instruments – Freehand Navigation", Invited Talk, Chinese Orthopaedic Association Annual Meeting, Beijing, China, November, 2014.

226. Urish, K.., Demuth P., Kwon B., Haider, H. Craft, D., Wood T. and Davis, C. "Activation of the Biofilm Persister Population: A Potential New Adjunct Therapy to Periprosthetic Joint Infection", Paper 191, Proceedings of the Annual Meeting of the American Academy of Orthopaedic Surgeons (AAOS), Las Vegas, NV, March 2015.

227. Brolin, T. J., Sykes, J.B., Haider, H., Sperling, J.W. and Throckmorton, T., "Vitamin E Polyethylene Demonstrates Less Volumetric Wear at 5 Million Cycles in Reverse Shoulder Arthroplasty Model", Paper 351, Proceedings of the Annual Meeting of the American Academy of Orthopaedic Surgeons (AAOS), Las Vegas, NV, March 2015.

228. Haider, H., Barrera, O.A., Al-Shawi, I., Konigsberg, B.S., Hartman, C.W., Mihalko, W.M., Lavernia, C.J. and Garvin, K.L., "Smart Tools in Orthopaedic Surgery", Scientific Exhibit SE09, Proceedings of the Annual Meeting of the American Academy of Orthopaedic Surgeons (AAOS), Las Vegas, NV, March 2015.

**Special invited presentations**

229. Haider, H., "Topical engineering considerations of modern Total Hip Replacement systems", Main guest speaker lecture, invited by the Iwate Industrial Promotion Center, Government of Japan, 4th September 2009, Morioka City, Iwate, Japan.

230. Haider H, "Considerations and results of total hip replacement wear testing", Invited main speaker talk and training for InMetro, Ministry of Development, Industry and Foreign Trade, National Institute of Metrology, Standardization and Industrial Quality, Rio De Janeiro, Brazil. 8th September, 2011.

231. Haider H, "Considerations and results of Knee Replacement wear testing ", Invited main speaker talk and training for InMetro, Ministry of Development, Industry and Foreign Trade, National Institute of Metrology, Standardization and Industrial Quality, Rio De Janeiro, Brazil. 9th September, 2011.

232. Haider H, "Navigated Freehand Surgical Technology for Total Knee Arthroplasty", Invited Lecture, Memphis Orthopaedic Research Education Series, Memphis Research Consortium (Univ. of Memphis, Univ. of Tennessee, Campbell Clinic and Memphis Bioworks Foundation), Memphis, Tennessee, 21 Feb. 2013.

233. Haider, H., "Why perform evaluation testing?" Innovation and Methods in Preclinical Testing of Orthopedic Implants Science & Technology Seminar", sponsored by AMTI (Advanced Mechanical Technology, Inc.) and One Measurement Group, Ltd, Beijing China, April 24-25, 2013.

234. Haider, H., "Knee biomechanics and total knee replacement", Innovation and Methods in Preclinical Testing of Orthopedic Implants Science & Technology Seminar, sponsored by AMTI (Advanced Mechanical Technology, Inc.) and One Measurement Group, Ltd, Beijing China, April 24-25, 2013.

235. Haider, H., "Roadmap for preclinical implant evaluation", Innovation and Methods in Preclinical Testing of Orthopedic Implants Science & Technology Seminar, sponsored by AMTI (Advanced Mechanical Technology, Inc.) and One Measurement Group, Ltd, Beijing China, April 24-25, 2013.

236. Haider, H., "Testing standards: How to read them, what standards are applicable.", Innovation and Methods in Preclinical Testing of Orthopedic Implants Science & Technology Seminar, sponsored by AMTI (Advanced Mechanical Technology, Inc.) and One Measurement Group, Ltd, Beijing China, April 24-25, 2013.

237. Haider, H., "Total knee replacement wear testing", Innovation and Methods in Preclinical Testing of Orthopedic Implants Science & Technology Seminar, sponsored by AMTI (Advanced Mechanical Technology, Inc.) and One Measurement Group, Ltd, Beijing China, April 24-25, 2013.

238. Haider, H., "Hip biomechanics and total hip replacement", Innovation and Methods in Preclinical Testing of Orthopedic Implants Science & Technology Seminar, sponsored by AMTI (Advanced Mechanical Technology, Inc.) and One Measurement Group, Ltd, Beijing China, April 24-25, 2013.

239. Haider, H., D'Lima, D., "Effects of implant wear debris, especially metal-on-metal hips", Innovation and Methods in Preclinical Testing of Orthopedic Implants Science & Technology Seminar, sponsored by AMTI (Advanced Mechanical Technology, Inc.) and One Measurement Group, Ltd, Beijing China, April 24-25, 2013.

240. Haider, H., “Total Hip Replacement wear testing (in-vitro)”, Innovation and Methods in Preclinical Testing of Orthopedic Implants Science & Technology Seminar, sponsored by AMTI (Advanced Mechanical Technology, Inc.) and One Measurement Group, Ltd, Beijing China, April 24-25, 2013.

241. Haider, H., D’Lima, D., “How ASTM works, and invitation of researchers and practitioners in China to participate (from China!)”, Innovation and Methods in Preclinical Testing of Orthopedic Implants Science & Technology Seminar, sponsored by AMTI (Advanced Mechanical Technology, Inc.) and One Measurement Group, Ltd, Beijing China, April 24-25, 2013.

**Part II: Presentations and papers in national, regional and local conferences**

242. Haider, M.H.S, "Internal Static and Dynamic Phenomena in Vortex Amplifiers", Ph.D. Thesis, Department of Mechanical and Process Engineering, University of Sheffield, 1989, Sheffield, UK.

243. Haider, H., "Fluidic Hammer Device for Oil Drilling Operations", Research Report, Shell EXPRO (Aberdeen) and Shell KSEPL (Holland), 1990.

244. Boucher, R.F. and Haider, M.H.S., "Fluidic Percussion Drilling in Oil Exploration", IChemE Research Event, ISBN 0 85295 270 8, p. 335, Cambridge, England, Jan 1991.

245. Beck, S., Haider, H. and Boucher, R.F., "Fluidic Hammer Project, Final Report for Phases I and II", Industrial Report to Shell KSEPL, Holland, Department of Mechanical and Process Engineering, University of Sheffield, April 1992.

246. Tippetts, J.R., Boucher, R.F., Beck, S.B., Haider, H. and Priestman, G.H., "Review of Fluidics", Report on State of the Art in Fluidics Technology for British Gas, British Gas Investigator: Derek Stoves, ERS, Newcastle upon Tyne, April 1994.

247. Haider, H., Eames, I.W. and Hobbs, T.S., "Integrating CAL to Computer Control and Data-Acquisition", pp. 159-166, Conference Proceedings, Computer Aided Learning in Engineering, Sheffield, UK, Sept. 1994.

248. Hobbs, T.S., Eames, I.W., Haider, H., and Johnson, A.R., "The Energy Game: Using computer scenarios and simulation to teach engineers", pp. 267-274, Proc. Conference: Computer Aided Learning in Engineering, Sheffield, UK, Sept. 1994.

249. “Haider, H., “Technology and touch: A joint effort. How engineering, robotic surgery and computers are assisting orthopaedic surgeons in the operating room.”, Mini-Medical School lecture, UNMC Video Library and published on the UNMC Web-site. Spring 2001.

250. Haider, H., Walker, PS, Hess, DJ, Werner, FW, Bonsell, J., Croson, R.E., Garvin, K.L., “Importance of provision of degrees of freedom when measuring the constraint of total knees”, Poster presented at the 16th Annual Nebraska Biomedical Research Workshop, April 2003, Omaha NE.

251. Barrera, OA, Haider, H, Ali, HH, Garvin, KL, “Simulation and navigation for knee replacement surgery”, Paper presented at the 16th Annual Nebraska Biomedical Research Workshop, April 2003, Omaha NE.

252. Piltner, R., Mupparapu, S., Haider, H., Barrera, O.A., “Computational Modelling of Novel Implants for Minimally Invasive Knee Replacement Surgery”, Poster presented at the 16th Annual Nebraska Biomedical Research Workshop, April 2003, Omaha NE.

253. O’Leary, EL, Barrera, OA, Haider, H, “Virtual simulation of the human heart and echocardiography”, Paper presented at the 16th Annual Nebraska Biomedical Research Workshop, April 2003, Omaha NE.

254. Kyla Scarborough, Charles Blatchley, Fereydoon Namavar, Hani Haider, “SLA Wear Study in Biomedical Implants”, Session B15 - Techniques and Applications of Nuclear Physics, Annual American Physical Society, April Meeting, May 1-4, 2004.

255. Mupparapu S., Barrera O.A., and Haider H., “Orthotropic bone material model for finite element analysis of bone-implant combinations”, Heartland Biomedical Engineering Symposium (HBES), Omaha, NE, April 2005.

256. Barrera, OA, Sekundiak, TD, Garvin, KL, Haider, H, "Virtual-reality guided freehand bone cutting for arthroplasty; 3d assessment of cuts", Heartland Biomedical Engineering Symposium (HBES), Omaha, NE, April 2005.

257. Haider, H., Walker, P.S. and Blunn, G.W, “Are the kinematics of different TKR designs targeted for the same patient the same?”, Heartland Biomedical Engineering Symposium (HBES), Omaha, NE, April 2005.

258. Haider, H., “Biomechanics and Computer Aided Orthopaedic Surgery Research in Nebraska”, Invited Lecture, Heartland Biomedical Engineering Symposium (HBES), Omaha, NE, April 2005.

259. Haider, H., Editor, Proceedings Book of the Heartland Biomedical Engineering Symposium (HBES), Omaha, NE, 2005.

260. Swanson, SA; Lauder, AJ; Sekundiak, TD; Haider, H; Garvin, KL: Metal Augments in Revision Knee Arthroplasty: A Hindrance or a Helper? Twenty-Third Annual Meeting of the Mid-America Orthopaedic Association, Amelia Island, FL, April 20-24, 2005.

261. Tarkin, IS; Mormino, MA; Haider, H; Clare, MP; Sanders; RW: Superior Rigidity of the Anatomic Compression Arthrodesis Technique: A Biomechanical Analysis of Two Popular Ankle Fusion Constructs. Twenty-Third Annual Meeting of the Mid-America Orthopaedic Association, Amelia Island, FL, April 20-24, 2005.

262. H. Haider, S. Mupparapu, OA Barrera, and K.L.Garvin, "Optimal alignment of unicondylar knee replacement tibial components", University of Nebraska Medical Center, Department of Orthopaedic Surgery and Rehabilitation Report, 2004-2005.

263. Mupparapu, S., Garvin, K.L., Sekundiak, T.D., Lyden, E.R., Stoner J.A. and Haider, H., "Our estimates for accuracy and precision of Radiostereometric Analysis (RSA) in Total Hip Replacement using a Phantom model", Ibid.

264. H. Haider, B. O'Brien, R. Croson, D. Schroeder, R. Metzger, K.L. Garvin, "Knee Simulators under Force Control Can Discriminate Wear due to Small Differences in TKR Design", Ibid.

265. Namavar, F., Blatchley, C., Haider, H., Varma, S., Sabirianov, R.F., Cheung, C.L., Mei, W.N., Zeng, X.C. and K.L. Garvin, “Ion Beam Engineered Nanocrystalline Ceramic films for Alternative Bearing Surfaces”, Invited paper, 53rd Midwest Solid State Conference Department of Physics, University of Missouri-Kansas City (UMKC), October, 2006.

266. Barrera, OA, Croson, R., O'Obrien, B., Garvin K. & Haider, H., "Aspects of simulation and computer-aided surgical technology", Invited talk, Computer Aided Surgical Technologies (CAST) Simulation Symposium, University of Nebraska Medical Center, June, 2007.

267. Haider, H., "Fixed or mobile bearing Total Ankle Replacement designs: What really matters?", Invited Talk, Inbone Technologies Educational Event, Toronto, July 2007.

268. Haider, H., "Aspects of simulation and computer-aided surgical technology", Invited Talk, Computer Aided Surgical Technology (CAST) Simulation Symposium, UNMC/Nebraska Medical Center, June 2007.

269. Haider. H., "Machines, Mechatronics and Software for Medicine, at the doorsteps of the PKI", Invited Speaker, Bioinformatics Interest Group Meeting, Peter Kiewit Institute, University of Nebraska at Omaha. 13th March, 2008.

270. Haider, H., Barrera, O. A. and Garvin, K.L., "Image Guided Navigation of Freehand Operated Orthopaedic Surgical Instruments." 2009 Nebraska Research and Innovation Conference, Experimental Program To Stimulate Competitive Research (EPSCoR), Omaha, NE, Sept. 19, 2009.

271. Haider, H., Ushering in the Era of Non-Implant Specific Instruments for Knee Arthroplasty. Heartland Biomedical Association Annual Meeting, November 8, 2013, Omaha, NE.

**Published audiovisual or computer-based educational materials and computer software**

272. "Computer Based Learning Developments in Mechanical Engineering at Sheffield University", Software for Engineering Education, Eames, A.R. Johnson, T. Hobbs, H. Haider and I.C. Howard, Pub. CTI Centre for Engineering, Queen Mary and Westfield College, London Autumn 1993.

273. "Technology and touch: A joint effort. How engineering, robotic surgery and computers are assisting orthopaedic surgeons in the operating room.", Mini-Medical School video lecture by H. Haider, UNMC Video Library & UNMC Web-site. Spring 2001.

274. USMDO.org (United States MD Overseas) – Web-based UNMC Expert Medical Second Opinion software. University of Nebraska Medical Center/The Nebraska Medical Center's office of International Healthcare Services (IHS).

**Examples of unsolicited media reports about my work**

275. British Broadcasting Corporation (BBC) International Science Program, showed a ¼ of a whole program with me as main interviewee about the prototype Knee Testing Simulators I produced in Stanmore / England, 1999.

276. Orthopedics Today, the International popular magazine published in its June 2005 issue a feature article titled “Freehand cutting in TKR can slash cutting time”, on the study presented by Dr. Hani Haider, Mr. Andres Barrera, Dr. Todd Sekundiak and Dr. Kevin Garvin at the American Academy of Orthopaedic Surgeons in that year.

277. UNMC Discover Magazine published a feature article titled “Leading the way in joint replacement surgery”, by Mr. Tom O’Connor, highlighting the arthroplasty outcomes and minimally invasive research of Dr. Kevin Garvin and Dr. Todd Sekundiak. The article centrally featured the novel Computer Navigated Freehand Bone Cutting system for knee replacement developed by Dr. Hani Haider and Mr. Andres Barrera.

278. Omaha World Herald, “Software to give surgeons a leg up”, Article written by Emily Gersema, Sunday July 4, 2004, Iowa; Midlands; Nebraska; Sunrise Edition, Featured how scientists in Omaha hope to improve the precision of arthroplasty surgery with a new computer system that would help doctors plan and even simulate a joint-replacement operation long before they go into the operating room.

279. Also featured on two separate occasions/programs on local educational radio in Omaha, and once on local public TV. The Mini Medical School lecture on computer aided surgery mentioned above was broadcast on local educational TV; with tens of repeated showings so far.

280. Orthopaedics Today, October 2014, whole article by Katie Pfaffabout my invited talk at European Federation of Orthopaedics and Traumatology (EFORT) conference in June 2014, titled: “Consider allergic reactions when choosing coated TKA implants.”