WORKSHOP ON MODULARITY & TAPERS IN TOTAL JOINT REPLACEMENT DEVICES

Sponsored by ASTM Committee F04 Medical & Surgical Materials & Devices

Symposium Chairs: A. Seth Greenwald, D.Phil.(Oxon)
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ABOUT THE WORKSHOP

Objective
The purpose of this Workshop is to provide a forum for consensus development and scientific exchange on the needs for characterization and standardized testing related to modularity and tapers used in total joint replacement devices. The main focus of this Workshop is to address unmet standardization needs and to help establish best testing practices in the following four areas:

- Characterization of Fretting, Taper Corrosion & Associated Adverse Tissue Reactions
- What Do Retrievals Tell Us in Total Joint Arthroplasty?
- Contemporary & Evolving Test Methodologies
- Design Parameters for Taper Connections in TJA

Each topic of interest will be addressed by a faculty whose brief is to present methodological innovations relevant to the title of the workshop including a discussion of elements in each presentation that merit consideration for standardization.
ASTM WORKSHOP PROGRAM

8:00 AM
Welcome & Opening Remarks
A. Seth Greenwald, D.Phil.(Oxon), Symposium Co-Chair

8:05 AM
Talk 1: AAOS Member Survey on the Usage of Modular Tapered Junctions in TJA
William M. Mihalko, M.D., Ph.D., Symposium Co-Chair

8:17 AM
Talk 2: The Revision Rates of Femoral Stem Prostheses with Exchangeable Necks: What Does the Australian Registry Tell Us?
Jorge Garcia, Office of Product Review, Therapeutic Goods Administration

8:29 AM
Talk 3: Regulatory Update on Modular Femoral Stem Tapers: What We Look For & Study Overviews
John S. Goode, Center for Devices & Radiological Health, USFDA

8:41 AM
Talk 4: The Role of ASTM Standards & Taper Corrosion Litigation
J. Stephen Bennett, Esq., and Adrienne Busby, Esq., Faegre Baker Daniels

SESSION I: Characterization of Fretting, Taper Corrosion & Associated Adverse Tissue Reactions
Session Chairperson: Steven M. Kurtz, Ph.D., Symposium Co-Chair

8:53 AM
Keynote Talk 5: Understanding Mechanically-Assisted Fretting & Taper Corrosion: Where We Are Today
Presenter: Jeremy L. Gilbert, Ph.D., FBSE

9:23 AM
Talk 6: Assessing Electrochemical Behavior in Mixed Metal Modular Taper Connections
Presenter: Markus A. Wimmer, Ph.D.

9:35 AM
Talk 7: Local Histological & Systemic Effects of Corrosion & Corrosion Products
Presenter: Robert M. Urban, Ph.D.

9:47 AM
Talk 8: Differences in Failure Mode & Tissue Response: The Influence of Head Diameter
Presenter: Christoph H. Lohmann, M.D.

9:59 AM
Talk 9: Modularity & Tapers in TJA: A Clinician's Perspective
Presenter: J. David Blaha, M.D.

10:11 AM - Roundtable Discussion

10:31 AM - Break

Updated: October 17, 2013
SESSION II: What Do Retrievals Tell Us in Total Joint Arthroplasty?
Session Chairperson: William M. Mihalko, M.D., Ph.D., Symposium Co-Chair

10:51 AM
Talk 10: What Are the Retrieval Parameters That Characterize Taper Corrosion & Wear?
Presenter: Jack E. Lemons, Ph.D., Symposium Co-Chair

11:03 AM
Talk 11: The Influence of Femoral Head Size on Taper Corrosion & Fretting in THA
Presenter: Timothy Wright, Ph.D.

11:15 AM
Talk 12: Taper Fretting Corrosion in Large Diameter HXLPE Bearings: Caveat Emptor
Presenter: Steven M. Kurtz, Ph.D., Symposium Co-Chair

11:27 AM
Talk 13: Mixed Metal Modular Femoral Head & Taper Connections: The European Gold Standard
Presenter: Ian Clarke, Ph.D.

11:39 AM
Talk 14: Backside Wear and Corrosion Damage in Modular Metal-on-Metal Acetabular Liners
Presenter: Matthias T. Agne

11:51 PM - LUNCH

SESSION II: What Do Retrievals Tell Us in Total Joint Arthroplasty? (Continued)
Session Chairperson: William M. Mihalko, M.D., Ph.D., Symposium Co-Chair

1:00 PM
Talk 15: Taper Corrosion in Modular Total Knee Arthroplasty
Presenter: Christina Arnholt

1:12 PM
Talk 16: Fretting Corrosion in Total Shoulder Replacement
Presenter: Judd S. Day, Ph.D.

1:24 PM - Roundtable Discussion

SESSION III: Contemporary & Evolving Test Methodologies
Session Chairperson: Jack E. Lemons, Ph.D., Symposium Co-Chair

1:44 PM
Talk 17: Femoral Stem Modularity: A Structural Fatigue Characterization
Presenter: A. Seth Greenwald, D.Phil.(Oxon), Symposium Co-Chair

1:56 PM
Talk 18: The Measurement of Tapers
Presenter: Richard J. Underwood, Ph.D.

2:08 PM
Talk 19: A Quantitative Taper Angle Measurement Method
Presenter: S. B. Kocagoz

Updated: October 17, 2013
2:20 PM
**Talk 20: A Method for Measuring Taper Junctions on Retrieved and In Vitro Simulator Specimens**
Presenter: Christian Maul

2:32 PM
**Talk 21: A Methodology for Characterizing Taper Wear & Corrosion in Hip Explants**
Presenter: Matthew Di Prima

2:44 PM
**Talk 22: A Finite Element Failure Predictor at Modular Femoral Head Taper Junctions**
Presenter: John J. Callaghan, M.D.

2:56 PM – **Roundtable Discussion**

3:16 PM - **Break**

**SESSION IV: Design Parameters for Taper Connections in TJA**
**Session Chairperson:** A. Seth Greenwald, D. Phil.(Oxon), Symposium Co-Chair

3:36 PM
**Talk 23: The Influence of Taper Roughness & Assembly Force on Junction Strength**
Presenter: Richie H.S. Gill, D.Phil.(Oxon)

3:48 PM
**Talk 24: The Influence of Taper Geometry on Torque and Tensile Disassembly at Taper Interfaces**
Presenter: Dave Schroeder

4:00 PM
**Talk 25: An Accelerated In Vitro Evaluation to Generate Clinically Observed Fretting at Taper Junctions**
Presenter: Imran Khan, Ph.D.

4:12 PM
**Talk 26: Accelerating Fretting Corrosion Testing of Modular Necks for THA**
Presenter: Jon Moseley, Ph.D.

4:24 PM
**Talk 27: A Summary of Factors Affecting Fretting Corrosion in Modular Total Hip Replacements**
Presenter: Gordon Blunn, Ph.D.

4:36 PM – **Roundtable Discussion**

4:56 PM
**Remains of the Day: Closing Remarks**
Steven M. Kurtz, Ph.D., Symposium Co-Chair

5:00 PM
Adjourn