Internship at Waterloo University and Current State of PhD Thesis

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12th October 2016
Internship at Waterloo University

Waterloo, Ontario, Canada

- City in Southern Ontario
- Population 98,780
- Next the city of Kitchener

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University of Waterloo, Ontario, Canada

- Internship (6 Jun 2016 – 27 August 2016)
- Established 4 July 1956
- **1,099** Academic staff
- **35,900** Students

**Faculties**
- Applied Health Sciences
- Arts
- Engineering
- Environment
- Mathematics
- Science

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Campus - University of Waterloo

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Research Programme – Structure

Department of Mechanical and Mechatronics Engineering

Professor John B. Medley

Western University, London Bone and Joint Institute

Assistant Professor Matthew G. Teeter

Samples

13 retrieval liners

Analysis

Computer Tomography & Optical Scanning

Comparison with clinical data

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Reverse shoulder joints $\rightarrow$ CT measurement

- Analysis of volumetric wear
- Wear scare
- Comparison with new model
- First study

Reverse shoulder replacement
Wrist kinematic
Retrieval joint replacements

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Research Programme – Results

Possible Cooperation
• Waterloo University
  • John B. Medley – Shoulder joints
  • Dan Langhor – Kinematic of wrist

• Western University
  • Matthew G. Teeter – CT analysis of hips and knees

Publications
SUBMITTED:
• Wear and roughness of bearing surface of retrieved polyethylene Bicon cups
  ACTA ORTHOPÆDICA ET ACTA ORTHOPEADICA IF 0.64

POSSIBLE FUTURE PUBLICATIONS:
• Influence of Positioning Retrieved Acetabular Liners in Vivo on the Wear Rate Determined by micro CT
• Analysis of retrieved cups by Raman measurement
• Analysis of retrieved polyethylene reverse shoulder cups

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Current State of PhD Thesis

Method
- Wear Analysis of Extracted Polyethylene Acetabular Cups Using a 3D Optical Scanner

Validation
- SUBMITTED

Clinical Application
- Wear and roughness of bearing surface of retrieved polyethylene Bicon cups

Extension of method
- Influence of position
  - Material changes
  - Prediction of Wear - FEA
  - Topography

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Highlights

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Toronto – Niagara Falls

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Canadian Rockies

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Thank you for your attention.