



EPSRC International Centre to Centre Collaboration: Universities of Leeds and Denver, DePuy Synthes. **A springboard for data sharing**

Alison Jones

Overview of Leeds-Denver-DepuySynthes collaboration

Aim: To reduce variability in outcome of hip/knee implants through individualised treatment based on patient-specific evidence.

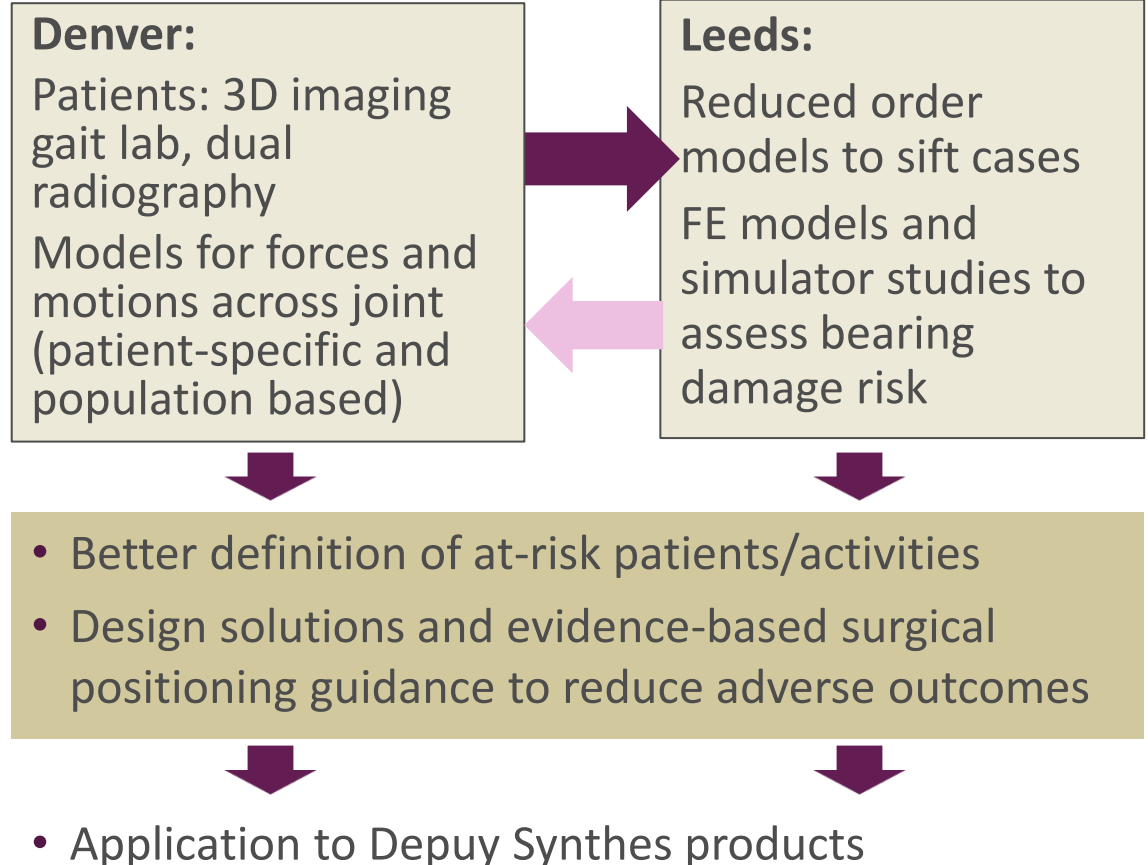
Combine patient-specific measurements and population-based simulations of joint biomechanics (at Denver) with analysis of implant mechanics and tribology (at Leeds) to generate evidence on how patient characteristics and surgical choices affect implant performance.

Hip: total hip replacement

Knee: total knee replacement and osteochondral graft repair

4 years from Jan 2022

- Press release: <https://www.ukri.org/news/international-collaborations-to-develop-technologies-of-tomorrow/>



Theme: defining common, open standards for data exchange

<https://www.oatechnetwork.org/public-news/oatech-network-data-sharing-report/>

- Barrier in the effort and cost involved in the preparation of data for sharing and reuse
- The need for the OA community to clearly see the benefit of data sharing to invest that cost
- Needs to develop data sharing practices that enable the reuse of data for different purposes
- ...and to demonstrate their benefits
- Establish wider consensus around methods of sharing patient biomechanical measurement data

Aims within Centre-to-Centre project

- Defining common, open standards for data exchange across the pathway of data acquisition and modelling platforms.
- Extend the data sharing work undertaken within the EPSRC OATech Network+, through workshops engaging the MSK research community.
- Identify data requirements for a variety of relevant applications.
- Jointly publish recommendations on a digital infrastructure for generating combined datasets and efficient data sharing, providing a framework for future activities across multiple research centres.

Theme: defining common, open standards for data exchange

Aims within Centre-to-Centre project

- Defining common, open standards for data exchange across the pathway of data acquisition and modelling platforms.
- Extend the data sharing work undertaken within the EPSRC OATech Network+, through workshops engaging the MSK research community.
- Identify data requirements for a variety of relevant applications.
- Jointly publish recommendations on a digital infrastructure for generating combined datasets and efficient data sharing, providing a framework for future activities across multiple research centres.

Focused workshop

- Spring 2023
- ~10 people, travel expenses paid, focused working
- Generate user requirements for ideal open databases on MSK research
- Identify a group of academic, industrial and third sector partners
- Publish outcomes through networks, OATech Network+

User requirements for an ideal open database: example

Need:

To assess an individual's potential for hip joint impingement across a representative range of activities, encompassing the variety of ways that they may use that joint.

Dataset description:

Hip motions and forces for a wide range of activities, performed by a range of individuals.

Impact:

Better patient-specific treatment triage for hip pain and targeted surgical bone removal.

Data collection design

- Activities including commonly collected (walk, sit-to-stand, etc.), higher demand (squat, loaded movements, etc.), and sports (football, hockey, climbing, etc.).
- *Metadata: which hip angle(s) dominate movement, consistency across people, amateur-professional differences*
- People performing those activities range from 10 to 50 years old, a balance of male and female
- *Metadata: any MSK conditions or pain, posture and pelvic tilt data,*

Specific measurement types:

- ... measurements, calibration, coordinate systems, file formats,

Please get in touch if you could articulate a similar need: a.c.jones@leeds.ac.uk

Workshop at CMBBE 2023
