



**DORSET**  
Local Enterprise Partnership

**Orthopaedic  
Research Institute  
Phase 2**

**End of Project Report**

**March 2021**

## PROJECT SUMMARY

The prime purpose of the project was to build on the outstanding progress that the Orthopaedic Research Institute (ORI) has made since its inception in 2015. The project allowed ORI to build on the success of work achieved in Phase 1, with the further aims of promoting trade nationally and internationally through research and educational activities.

In order to meet key elements of the Dorset Local Enterprise Partnership's (LEP) Strategic Economic Plan, ORI capitalised on the Bournemouth University (BU) Global Engagement Strategy, through the development of ORI's facilities and the formation of international partnerships. The funding awarded has enabled ORI to purchase state-of-the art diagnostic equipment; develop and create industry leading robotic surgery virtual reality simulators and a digital training platform; develop and create a data management portal; and extend the digital training platform with Apps to deliver CHAIN (an exercise and education programme to help the self-management of hip osteoarthritis); train hospital staff on Enhanced Recovery after Surgery pathways; and train surgeons on Hip Fellowships. In addition, further office space, a development lab, a virtual reality training lab, and physiological testing labs were built, along with clinic room space in order to review and assess research participants.

The aims of the project were:

- To attract up to £100M of inward investment by supporting at least 2 companies per year for 5 years, through R&D activity and introduction to global market through ORI global hubs.
- To create up to 200 jobs across ORI and associated partners over 5 years.
- To train over 50 surgeons and health professionals every year through postgraduate training courses.
- To enrol over 100 participants per year in clinical trials

|                         |                                |
|-------------------------|--------------------------------|
| Project start date      | 28 <sup>th</sup> November 2018 |
| Project completion date | 31 <sup>st</sup> March 2021    |

Outcomes:

Table 1 - The intended outcomes of the project are as follows:

| INDICATORS  |                          |                        | OUTCOMES FORECAST |          |          |          |          |                |                          |             |
|---|--------------------------|------------------------|-------------------|----------|----------|----------|----------|----------------|--------------------------|-------------|
|   | ORIGINAL AGREED OUTCOMES | ACTUALS UP TO FY 19/20 | FY 20/21          | FY 21/22 | FY 22/23 | FY 23/24 | FY 24/25 | FORECAST TOTAL | FORECAST & ACTUALS TOTAL | VARIANCE    |
|   | <b>TOTAL</b>             | <b>TOTAL</b>           |                   |          |          |          |          |                |                          |             |
| Jobs (within ORI and through associated partners) (Phase 1 + Phase 2)   | Up to 700                | 61                     | 2                 | 5        | 5        | 5        | 5        | 22             | 83                       | n/a         |
| Private leveraged investment  | £1.8m                    | £463,185               | £512,896          | £50,000  | £50,000  | £50,000  | £50,000  | £250,000       | £1,176,081               | -£623,919   |
| Public leveraged investment   | Not specified            | £1,134,617             | £279,315          | £50,000  | £50,000  | £50,000  | £50,000  | £250,000       | £1,613,932               | +£1,613,932 |
| Third sector leveraged investment   | Not specified            | £76,831                | 0                 | 0        | 0        | 0        | 0        | 0              | £76,831                  | +£76,831    |
| Enterprises receiving financial support other than grants & Businesses created  | Not specified            | 2                      | 0                 | 0        | 0        | 0        | 0        | 0              | 2                        | +2          |
| Enterprises receiving non-financial support (attracting inward investment of £100m by supporting at least 2 companies per year for 5 years) | 10                       | 9                      | 9                 | 9        | 9        | 9        | 9        | 9              | 9                        | -1          |
| Training surgeons & health professionals (through postgraduate courses)   | 100 annually             | 40                     | 80                | 100      | 100      | 100      | 100      | 480            | 520                      | -230        |
| Clinical trials participants  | 170 annually             | 858                    | 0                 | 170      | 170      | 170      | 170      | 680            | 1538                     | 163         |

Throughout the project the planned and agreed outcomes of the project have been routinely monitored and evaluated, with all of the procurement and estate related outcomes already completed. The outstanding investment, enterprise, and training outcomes, remain on track to be achieved by 2025, even withstanding the challenges of the COVID-19 pandemic. Evidence to support and corroborate funding and outcome generation has been supplied to the Dorset LEP for all outcomes, and will be continued to do so.

## BENEFITS REALISED TO DATE

- This project has realised multiple benefits to a wide range of stakeholders including the general public, patients, health professionals, academics, and industry partners. These outcomes are summarised in Table 1.
- These benefits have had a wider impact, specifically on local and national enterprises and businesses, where ORI's work has helped not only with research and development, but also with strategic, regulatory, and commercial success. Specific examples, with data and stakeholder feedback are provided within this document
- Future similar benefits will continue to be realised as ORI continues to work with and have active projects with a wide range of local, national, and international orthopaedic businesses.

OUTPUTS AND OUTCOMES:

ORI ACADEMIC RELATED OUTCOMES

Since its formation in 2015, ORI continues to develop as an outstanding and high performing clinical research institute. For its size and stage of development, the outcomes achieved are exceptional, and a summary of academic related outcomes are provided below.



PROJECT SPECIFIC OUTPUTS AND OUTCOMES

**Expansion of ORI offices and purchase of specialist equipment**

ORI offices were expanded to include virtual reality training and physiology labs, further office space and clinic rooms (an additional 247.6 m sq). The ORI clinic, situated on the ground floor of the Executive Business Centre is an outstanding clinic facility, and has already been used for over 1000 research participant visits (this is despite the facility having to close for 15 months due to the COVID-19 pandemic). These visits have been completed as part of externally funded research projects from funders such as Innovate UK, The National Institute for Health Research, and multi-national medical

device companies such as Stryker; as well as supporting internal PhD projects and pump priming development research. The facilities include, a state-of-the-art dedicated gait laboratory, a physiological testing laboratory (including the Primus RS equipment), 2 clinical assessment rooms, an office, and a reception/waiting area. Both the gait laboratory and physiological testing laboratory have already been utilised for over 500 research participant visits.



Equipment purchased by ORI includes:

**Robotic Hip Replacement Virtual Reality Simulators**



Ultrasound scanner

IT software solution

Activity monitors

Shockwave equipment

**Fundamental hip replacement virtual reality simulators**



Digital platform, with Apps for CHAIN, ERAS and Fellowship training

Orthopaedic stimulators

Static cycles

Wattbikes



**Static 3D imaging  
body scanner**



**Portable 3D imaging  
body scanner**



## International Work/Global Hubs

Whilst international travel has been limited and the attention of potential collaborators diverted due to the COVID-19 pandemic, the development of ORI Global Hubs and international partnership has continued remotely. Memorandums of understanding have already been agreed with two partners in South Africa and India, and further partnerships in Singapore, Hong Kong, and Perth (Australia) are in development and planned.

- ORI signed a memorandum of understanding with the University of Cape Town (UCT), making it the first of the planned ORI global hubs. UCT is among the top 10 universities in the BRICS countries and is consistently the top-ranked university in Africa. ORI plans to work on a range of research projects with South African colleagues in the future, and collaborative work has already started during the pandemic period. Associate Professor Tom Wainwright assisted colleagues remotely with quality improvement expertise in order to optimise throughput within the Covid-19 testing facility at Groote Schuur Hospital, and has acted as an external clinical expert for postgraduate research degree interviews. In addition, he has also been invited to collaborate with Dr Ulla Plenge (Consultant Anaesthetist at Groote Schuur Hospital) on her national project to implement Enhanced Recovery after Surgery for hip and knee replacement and has a publication in preparation with Associate Professor Delva Shamley (Head of UCT Clinical Trials Unit).
- BU has signed a memorandum of understanding with the Sri Ramachandra University in Chennai, India. Further to this, Professor Rob Middleton was invited to become a Visiting Professor and deliver the Endowment Oration for Prof S.S.K. Marthandam at the Sri Ramachandra Institute of Higher Education and Research Institute on 21<sup>st</sup> March 2021. The Sri Ramachandra University have asked Professor Middleton and colleagues at ORI to help them set up and establish a robotic joint replacement over the next 2 years. This will provide excellent research and collaboration opportunities.
- In regard to establishing the other global hubs, excellent progress and development has been made
  - Tom Wainwright has been invited to become a Visiting Professor at the University of Hong Kong, and will visit Hong Kong to deliver a series of lectures and explore collaboration opportunities in November 2021. During this visit, he is also an invited key note speaker at the Combined 60th Anniversary Scientific Meeting and 17th Hong Kong International Orthopaedic Forum.
  - Prof Rob Middleton and Associate Professor Wainwright were successful in securing a mobility grant from Santander to promote research collaborations, and had to

postpone their visit to see colleagues at the National University of Singapore. This visit will instead happen as soon as travel restrictions and pandemic allow.

- Additional Santander mobility grants were also secured by ORI to facilitate networking and learning opportunities for staff, with trips to the University of Sao Paulo and to Northeastern University in Boston. These visits were very successful, and have resulted in collaborations and joint publications, as well as ORI staff member Shay Bahadori becoming a finalist at Santander Universities Student Impact Awards 2019 for his collaborative work.

### **ORI support of regional and national UK businesses**

Supporting local businesses and helping to promote local economic growth alongside ORI's research and educational activities remains a key focus for the ORI team, and there are a number of explicit examples of regional partnerships to demonstrate this success.

#### **Local Academic and Healthcare Networks**

ORI continues to play an active role in growing and fostering regional academic and healthcare networks, these partnerships are vital to help grow the regional musculoskeletal ecosystem, and help to improve the care of patients locally. ORI works in collaboration with

- NIHR Applied Research Collaboration Wessex (<https://www.arc-wx.nihr.ac.uk/>)
- NIHR Clinical Research Network
- Wessex Academic Health Science Network (<https://wessexahsn.org.uk/>)
- Fortisnet (<https://www.southampton.ac.uk/life-sciences/health-and-medicine/active-bodies/fortisnet.page>)

In addition, ORI's research outcomes and collaborative working was cited as an exemplar in documentation submitted in order for the newly merged Poole and Bournemouth hospital trust to attain university status. This key role in bringing together the collaboration between Bournemouth University, Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust and Poole Hospital NHS Foundation Trust to form the University Hospital Dorset NHS Foundation Trust will be vital for future developments locally. Professor John Vinney, vice-chancellor of Bournemouth University, was pleased the merger could finally take place, stating: "We have a long history of close working with both trusts, and have been doing so very effectively for many years. "This joint work has included training staff, jointly publishing research and working together to enrich society and focus on societal benefit.

### **BU 2025 Strategic Investment Areas**

ORI continues to have an important role contributing towards the current BU2025 strategy, and leads on research in three of the four BU Strategic Investment Areas:

**Medical Science** - “Evaluation of Health Outcomes for Mako Hip Replacement” study, “Tracking physical activity after Total Knee Arthroplasty” study; “A pragmatic, randomised controlled trial with economic evaluation, to compare a cycling and educational programme (CHAIN) with usual physiotherapy care in the treatment of hip osteoarthritis: CycLing and EducATion” (CLEAT)

**Assistive Technology** – “Evaluation of Health Outcomes for Mako Hip Replacement” study, “Tracking physical activity after Total Knee Arthroplasty” study; “Innovative Transfer Board” and “Glider” projects

**Animation, Simulation and Visualisation** – development of orthopaedic virtual reality simulators, training portal and Apps; evaluations of orthopaedic virtual reality simulators

#### **ORI’s research in the NHS and independent hospitals**

ORI works with industry leaders such as ZimmerBiomet and Stryker on implant studies at sites nationally and internationally.

The **Master SL** study has sites at University Hospital Dorset NHS Foundation Trust University, Bournemouth; Hospital Southampton NHS Foundation Trust, Southampton; University Hospital Llandough, Cardiff; and Robert Jones and Agnes Hunt Orthopaedic Hospital, Gobowen Oswestry.

The **Beyond Compliance G7** study has sites at University Hospital Dorset NHS Foundation Trust University, Bournemouth; University Hospital Llandough, Cardiff; Altnagelvin Hospital, Northern Ireland and Whittington Hospital, London.

The **G7 with Vivacit-E and Longevity Liners** study has sites at University Hospital Dorset NHS Foundation Trust University, UK; University Hospital Hvidovre, Denmark; Zuyderland Hospital, Netherlands; OCON Hengelo, Netherlands; Skane University Hospital, Sweden; University of Utah, US; Oregon Health and Science University; Colorado Joint Replacement, US; Duke University Medical Centre, US.

ORI also has the “**Tracking Physical Activity after Total Knee Arthroplasty**” study at Northumbria Healthcare NHS Foundation Trust; and the “**Evaluation of Health Outcomes for Mako Hip Replacement**” study at Nuffield Health, Bournemouth.

## FINANCES

- £950,000 was awarded by Dorset LEP for Phase 2 of the funding, and an additional £76,312.47 was funded in December 2021. All funding was spent.
- Bournemouth University spent £1,777,236.41 in matched funding from April 2018 to March 2021.

## LESSONS LEARNT

- Procurement of specialist, state-of-the-art equipment is often subject to single source tendering, so it is important to work closely with Procurement and Legal Services at BU and start the process early.
- The COVID-19 pandemic is causing delay in setting-up ORI global hubs in countries such as Singapore and Australia. However, the ability to work with international partners through on-line platforms such as Teams and Zoom, and the ability to collect data through an online portal, has opened new areas of interest and ways of collaborative working. A digital platform and Apps are now being developed which can enable training on robotic orthopaedic surgery and Enhanced Recovery after Surgery pathways and the delivery of studies to be done remotely.

### **ORI featured in “Made at Uni” national campaign**

In December 2018, ORI was showcased as part of a Universities UK (UUK) national campaign. This prestigious campaign, recognised ORI for its research into the conservative management of osteoarthritis and work on robotic hip surgery.

<https://microsites.bournemouth.ac.uk/ori/2018/12/07/orthopaedic-research-institute-features-in-national-campaign/>

## CONCLUDING SUMMARY

In summary, this project has successfully built contributed to the outstanding progress that the Orthopaedic Research Institute (ORI) has made since its inception in 2015. The project has allowed ORI to build on the success of work achieved in Phase 1, and the further aims of promoting trade nationally and internationally through research and educational activities have been delivered. This document provides clear examples of this work and success, and ORI remains on trajectory to achieve all project aims by 2025.

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