Digital Posters

IMPROVING THE MRI EXPERIENCE FOR CHILDREN

Dr Mona Seyed Esfahani, Dr Sarah Mills & Dr Mark Tighe

BACKGROUND:

Some children find magnetic resonance imaging (MRI) scans challenging due to factors such as noise and difficulties laying still
This may result in them needing sedation or general anaesthesia (GA)
Families and clinicians would like to explore ways to improve the MRI journey for children

20% The percentage of children who need a GA to achieve successful magnetic resonance imaging (MRI) of diagnostic quality

9% The percentage of inpatient paediatric MRI's under general anaesthetic that were performed on children with autism at UHD (April 2019 - March 2023)

£343 The cost of an MRI with play preparation alone (PIER network)

£1285 The cost of a 60 minute MRI under general anaesthetic (PIER network)

THE AIM:

- The project is a collaboration between Bournemouth University and University Hospitals Dorset and aims to develop a research design for investigating the paediatric patient journey, from their first visit to hospital to post MRI, using a patient participatory approach
- The sample will include neurotypical children between the ages of 4 and 10 and a nested cohort of 4 to 10 year olds with autism, attending University Hospitals Dorset for outpatient MRI scans
- The planned interventions will be co-designed and evaluated by children, their carers and the healthcare professionals looking after them

THE TIMELINE:

Phase one: exploring the patient journey (Nov 23-Mar 24)
- Round table discussion with paediatric team to establish aims of project
- Literature review on interventions used to improve paediatric patient experience (completed)
- Focus groups with experts in children with neurodiversity

Phase two: children's insight (Mar 24-Jun 24)
- Allowing children to explore the MRI scanner available at BU
- Discussion to gain insight into their perception
- Capturing children's experience using bodycam

Phase three: creating sample intervention (Jun 24 - Aug 24)
- Developing intervention examples to present to children
- Finalising the MRI patient experience journey for children with and without autism

Phase four: intervention co-creation (Aug 24 - Dec 24)
- Open and directed focus groups with children aged 4 to 10 and their parents/carers
- Design meetings
- Presentation of findings and application for funding to implement interventions

BENEFITS FOR FAMILIES:

- Better experience for children
- Quicker recovery and shorter hospital stay
- Reduced complications

BENEFITS FOR CLINICIANS:

- Reduced wait times for GA MRI
- Reduced costs
- Reduced complications

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NHS University Hospitals Dorset NHS Foundation Trust

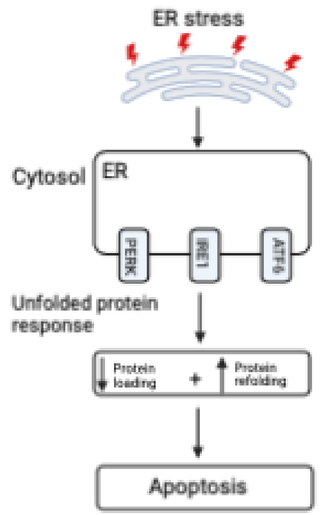
University Hospitals Dorset
NHS Foundation Trust

A case report of Pancreatic Exocrine Insufficiency in a patient with Parkinson's disease: a coincidence or is there more to it than meets the eye?

David Edwards (Royal Bournemouth Hospital), Mustafa Jalal (Gastroenterology, Royal Bournemouth Hospital)

Background

- There is emerging evidence suggesting PEI can be caused by conditions other than chronic pancreatitis, cystic fibrosis or pancreatic cancer.
- PEI results in maldigestion and malabsorption.
- PEI has a widely available and cost effective treatment with Pancreatic Enzyme Replacement Therapy (eg. CREON).



Case description:

- 60-year-old male presented to Gastroenterology clinic with persistent abdominal pain.
- Bloods tests (including amylase) and abdominal imaging (US-Abdo and CT-AP) were unremarkable
- Faecal elastase testing was diagnostic for severe PEI
- His past medical history contained none of the known risk factors for PEI. His only medical condition of note was Parkinson's disease.

Discussion

- We propose a novel association between PEI and Parkinson's disease in that the abnormal function of the Unfolded Protein Response (UPR) is shared between these two disease processes.
- The UPR is a cellular mechanism which aims to reduce the number of abnormally folded proteins within the cell
- There is a growing base of evidence demonstrating UPR dysfunction is noted in both Parkinson's disease and the development of pancreatitis, which is a common cause of PEI.
- For example, mice with an XBP1 mutation, a protein involved in the UPR, were chronically fed alcohol to induce pancreatic oxidative stress; this was then associated with an increase in pancreatic acinar cell death (1).

Suggestions

- Further research determining the incidence of PEI in the Parkinson's disease community
- Further work identifying the pathophysiological process leading to the development of PEI.

Reference:

1) Duplan E., Giaime E., Viotti J., Sévalle J., Corti et al. ER-stress-associated functional link between Parkin and DJ-1 via a transcriptional cascade involving the tumor suppressor p53 and the spliced X-box binding protein XBP-1. J. Cell Sci. 2013;126:2124–2133.

UK adults with type 1 diabetes utilise mainstream social media platforms such as Facebook and Twitter, alongside specialist healthcare professionals and charities, for information about their condition and for peer support

A Thompson[1], A Luce[1], K Appleton, H Partridge[2], J James[1]
[1] Bournemouth University [2] University Hospitals Dorset

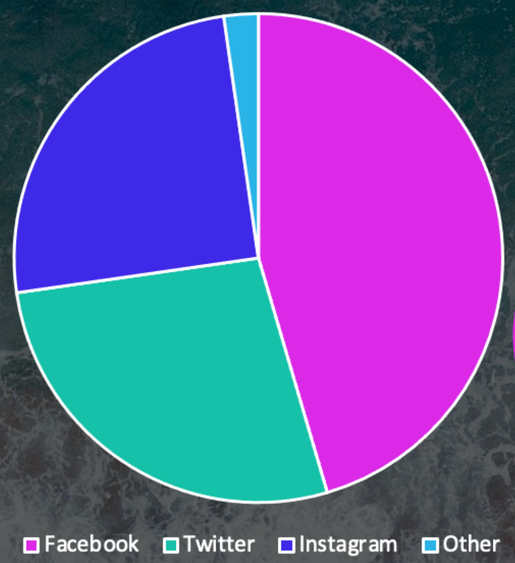
Aim: To understand the sources of diabetes information engaged with by adults with type 1 diabetes (T1D).

Method: An online questionnaire was developed and advertised via several diabetes charities and type 1 diabetes networks. Respondents were asked where they receive most of their diabetes information. Source options were grouped into categories and respondents could add their own. Respondents selected their top three sources and were asked to provide more detail if certain sources, like social media, were selected.

Results: 62 adults with type 1 diabetes completed the questionnaire, ranging in age from 18 – 72. There were 10 male and 52 female respondents. The top three sources were specialist diabetes healthcare teams (79%), social media platforms such as Facebook and Twitter (71%), and diabetes charities (40%). Other key sources were web sources like NHS online (32%), diabetes education courses (23%), and family and friends with diabetes (21%). Although social media was selected as a main source, when asked to specify where on social media information came from, 78% of participants specified other people with type 1 diabetes either in the form of peer support groups (54%) or the online type 1 diabetes community (24%). There were no significant differences across age groups or genders.

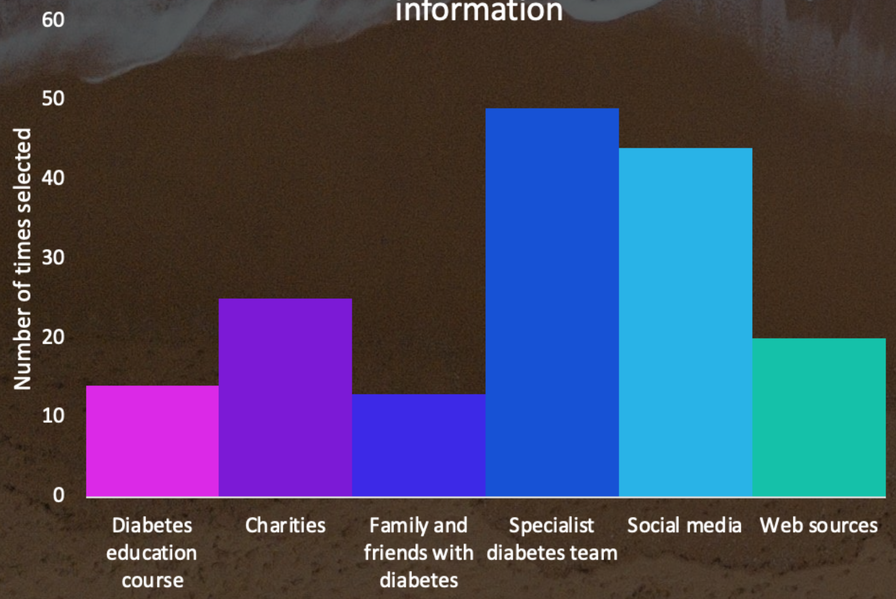
Conclusion: Specialist diabetes teams, charities and social media are key sources of diabetes information for people with type 1 diabetes. Where social media is used, the primary source of information is other people with type 1 diabetes, demonstrating the importance of peer support to those with type 1 diabetes.

Respondents answer to which social media site they get most of their diabetes information from

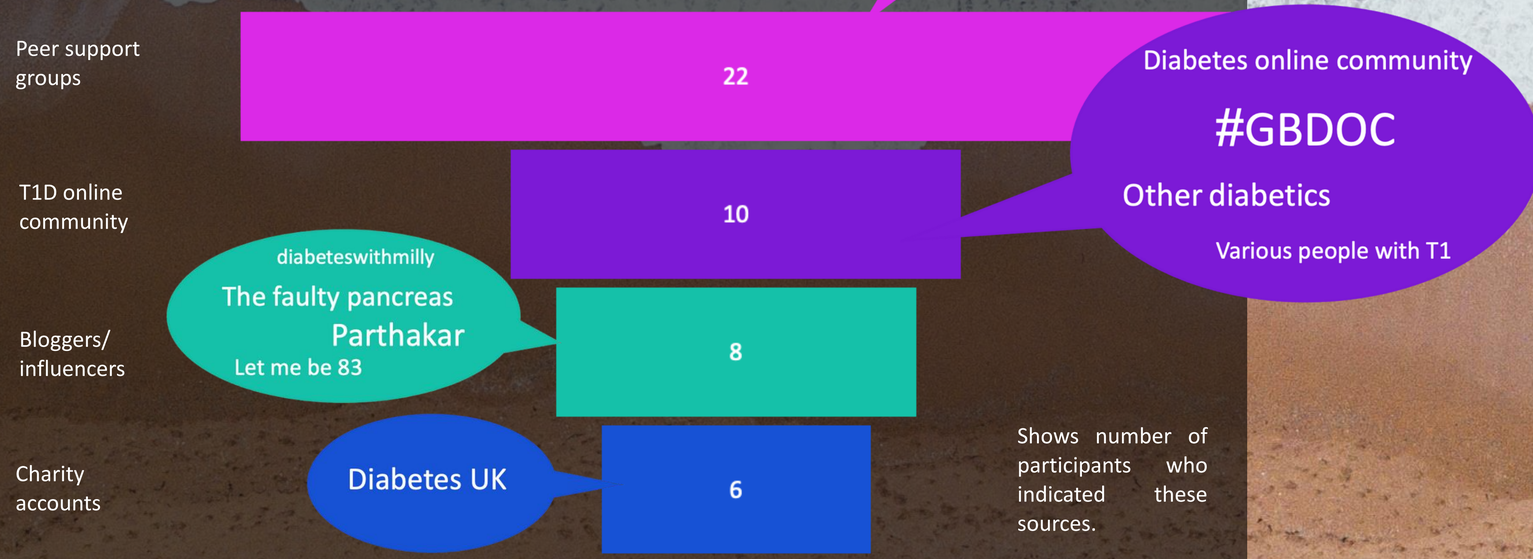


Sugarbuddies
Freestyle libre group
Diabetes support groups on FB
Dorset T1D group
Derby type 1 diabetes group
Peer support groups
Pumpbuddies
Looping groups
LIVT1D on Facebook

Respondents answers to where they get most of their diabetes information



Respondents answers when asked to specify where on social media diabetes information comes from



Diabetes online community
#GBDOC
Other diabetics
Various people with T1

diabeteswithmilly
The faulty pancreas
Parthakar
Let me be 83

Diabetes UK

Shows number of participants who indicated these sources.

Combat injury and heart rate variability- is there a relationship? Findings from the ADVANCE study

Lead Authors: Rabeea Maqsood[1], Prof. Ahmed Khattab[1], Prof. Christopher Boos[1,2]

1.Faculty of Health and Social Sciences, Bournemouth University, Bournemouth, UK.
2.Department of Cardiology, University Hospital Dorset, Poole, UK.

Introduction

Combat-related traumatic injury (CRTI) has been linked to an increased cardiovascular disease (CVD) risk. The long-term impact of CRTI on heart rate variability (HRV), a robust CVD risk marker, has not been explored. This study investigated the relationship between CRTI, the mechanism of injury and injury severity on HRV.

Methods

This was an analysis of baseline data from the ArmeD serVices trAuma rehabilitatioN outComE (ADVANCE) prospective cohort study. The sample consisted of UK servicemen with CRTI sustained during deployment (Afghanistan, 2003-2014) and an uninjured comparison group who were frequency-matched to the injured group based on age, rank, deployment period and role-in-theatre.

Root mean square of successive differences (RMSSD) was measured as a measure of ultra-short term HRV (HRV_{UST}) via ≤16s continuous recording of the femoral arterial pulse waveform signal (Vicorder). Other measures included injury severity [New Injury Severity Scores (NISS)] and injury mechanism.

Results

- 862 participants
- Mean age: 33.9±5.4 years
- 428 (49.6%) injured vs 434 (50.3%) uninjured.
- The median NISS for injured: 12 (6-27)
- Blast- the predominant injury mechanism (76.8%)

The mean time from injury/deployment to assessment: 7.91±2.05 years

RMSSD significantly lower in the injured versus the uninjured [39.47ms (27.77-59.77) versus 46.22ms (31.14-67.84), p<0.001].

CRTI associated with a 13% lower RMSSD versus the uninjured group (GMR* 0.87, 95%CI 0.80-0.94, p<0.001).

A higher injury severity (NISS≥25) (GMR* 0.78, 95%CI 0.69-0.89, p<0.001) was independently associated with lower RMSSD.

Blast injury (GMR* 0.86, 95%CI 0.79-0.93, p<0.001) was independently associated with lower RMSSD.

*Using multiple linear regression (adjusting for age, rank, ethnicity and time from injury), geometric mean ratio (GMR) was reported.

Conclusion

These results suggest an inverse association between CRTI, higher severity and blast injury with HRV. Longitudinal studies and examination of potential mediating factors in this CRTI-HRV relationship are needed.

This work was a part of RM's PhD studentship- jointly funded by Bournemouth University and the ADVANCE study, MoD UK.

Read the full paper here:

Currently, we are exploring the impact of combat trauma on HRV within the ADVANCE study. We would be excited to collaborate with others interested in the similar themes (combat trauma, CVD risk and HRV) - provided clearance from the ADVANCE study and Bournemouth University.

A multicentre comparative analysis of fixation versus revision surgery for periprosthetic femoral fractures following total hip arthroplasty with a cemented polished taper-slip femoral component

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[2]University Hospital Dorset, Bournemouth, UK.
Presenting Author: Mr Sebastien Crosswell[1,2]

BU-UHD Research Event- Collaborative Research: A Time for Action- May 2023

Background

- Polished taper-slip (PTS) femoral components are the most common cemented femoral components which are used in the UK
- The incidence of periprosthetic fractures is increasing by 13% each year and is a common indication for revision THA
- Traditionally a B2 Type periprosthetic fracture (fracture around the stem and cement mantle) would have been treated with revision surgery
- ORIF (fixation) of these fracture is also a recognised operative management of B2 fractures, providing anatomical reduction can be achieved
- The clinical evidence for operatively managing type B periprosthetic fractures around PTS components is sparse and there are only single-centre studies reporting clinical outcomes

Objectives

The aim of this study was to compare open reduction and internal fixation (ORIF) with revision surgery for the surgical management of Unified Classification System (UCS) type B periprosthetic femoral fractures around cemented polished taper-slip femoral components following primary total hip arthroplasty (THA).

Methods

- Data were collected for patients admitted to five UK centres
- The primary outcome measure was the two-year reoperation rate. Secondary outcomes were time to surgery, transfusion requirements, critical care requirements, length of stay, two-year local complication rates, six-month systemic complication rates, and mortality rates
- Comparisons were made by the form of treatment (ORIF vs revision) and UCS type (B1 vs B2/B3)

ORIBU Orthopaedic Research Institute Bournemouth University

Results

A total of 317 periprosthetic fractures with a median follow-up of 3.6 years (interquartile range (IQR) 2.0 to 5.4) were included. ORIF was performed in 167 (52.7%) and revision in 150 patients (47.3%).

Results (Revision vs ORIF):

- The 2-year reoperation rate (15.3% vs 7.2%; p = 0.021)
- Time to surgery (4.0 days (IQR 2.0 to 7.0) vs 2.0 days (IQR 1.0 to 4.0); p < 0.001)
- Transfusion requirements (55 patients (36.7%) vs 42 patients (25.1%); p = 0.026)
- Critical care requirements (36 patients (24.0%) vs seven patients (4.2%); p < 0.001)
- Two-year local complication rates (26.7% vs 9.0%; p < 0.001) were significantly higher in the revision group.

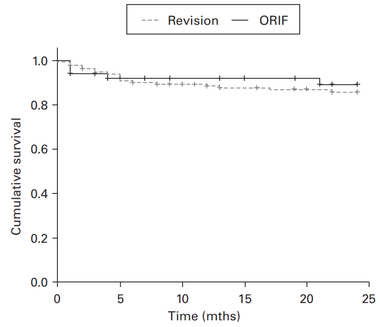

Fig. 3

Kaplan-Meier survival analysis of open reduction and internal fixation (ORIF) versus revision (type B2 and B3 fractures).

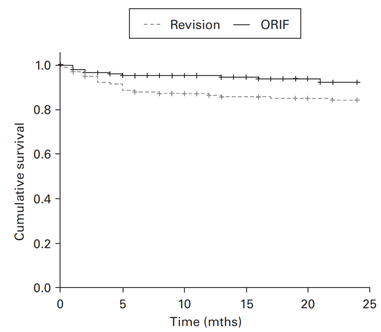

Fig. 1

Kaplan-Meier survival analysis of open reduction and internal fixation (ORIF) versus revision (all type B fractures).

Conclusions

Revision surgery has higher reoperation rates, longer surgical waiting times, higher transfusion requirements, and higher critical care requirements than ORIF in the management of periprosthetic fractures around polished taper-slip femoral components after THA. ORIF is a safe option providing anatomical reconstruction is achievable.

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The Dorset Health Village
A new and innovative Consultant-delivered NHS outpatient care model

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[1]Orthopaedic Research Institute, Bournemouth University, Bournemouth, UK

2University Hospitals Dorset NHS Foundation Trust, Bournemouth, UK

Presenting Author: Mr Samuel Whitaker

Lead Author: Mr Caesar Wek

BU-UHD Research Event- Collaborative Research: A Time for Action- May 2023

Background

- The waiting time for planned care such as orthopaedic outpatient appointments is currently at a record high, largely due to the impact of the Covid 19 pandemic.
- To tackle the backlog, the UK Government has invested £350 million in 40 new Community Diagnostic Centres (CDCs), including the Dorset Health Village (DHV) in Poole.
- Inspired by the Nightingale Hospital principle, the clinic was built rapidly from the ground up, occupying the top floor of Beales' Department store in Poole, and opened in October 2021.
- Orthopaedics, Ophthalmology, Breast Screening and Dermatology were early adopter specialities.
- The clinic aimed to add outpatient capacity, provide consultant-delivered care and decision making, reduce unnecessary follow up and investigation, and improve junior doctor training.
- The clinic also aimed to provide accessible, 'de-medicalised' outpatient services to the community.
- Patient Xrays and notes are reviewed prior to clinic, standard templates for clinical assessment and GP correspondence letters utilised to improve efficiency.
- Standard hip clinic New Patient appointment slots allow 20 minutes per consultation.

Objectives

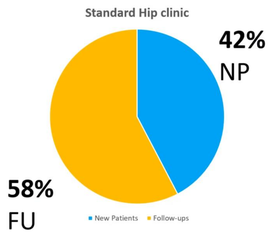
- To evaluate the efficacy of the DHV clinic model compared to a standard hip clinic (SHC)
- To assess patient satisfaction with DHV clinic model

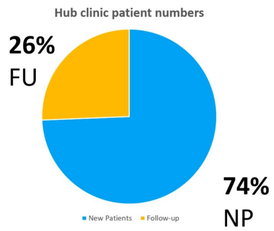
Methods

- Standard hip clinic (SHC) and DHV clinic outcome sheets were examined retrospectively, 100 patients in each group.
- Number of subsequent follow up appointments, number of patients listed for surgery, number of patients discharged, number of patients non-attending and number of same-day xray requests were compared between the SHC and DHV clinic.
- Patient satisfaction was assessed via written feedback forms.

Results

- 104 SHC patients and 117 DHC patients included over the period October 2021 to July 2022.
- Actual appointment time for New Patients in the SHC was 30 minutes on average – 10 minutes preparation, 10 minutes patient contact, 10 minutes documentation – often resulting in clinic overruns.
- DHV clinic template allocated 10 mins consultant-patient contact, with support from Extended Scope Physiotherapy and Live Well Dorset services as required.
- Follow up rate was reduced from 38% in SHC to 9% in DHV clinic
- Conversion rate for listing for surgery increased from 19% in SHC to 33% in DHV clinic
- Discharge rate increased from 31% (SHC) to 51% (DHV).
- New Patient proportion increased from 42% (SHC) to 74% (DHV)
- DNA rate reduced from 12% (SHC) to 6% (DHV)
- Overall satisfaction rated Very Good by 95% of patients.





	Standard Hip clinic	Hub clinic
Total patients (n)	104	117
Telephone app. (%)	29	0
New Patients (%)	42	74
Follow-up Patients (%)	58	26
	Patient outcomes	
Follow-up (%)	38	9
Listed for surgery (%)	19	33
Discharge (%)	31	51
DNA (%)	12	6
Same-day X-ray (%)	31	0

Conclusions

- The DHV clinic model increased the number of New Patients seen compared to the SHC, while reducing follow up appointments by 75% and halving the number of missed appointments.
- Patient satisfaction was very high when attending the DHV clinic.

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Treating Shoulder Pain Collaboratively; innovative MSK waiting list initiative physio clinic.

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1. Musculoskeletal Outpatients, Christchurch Hospital, University Hospitals Dorset
2. Physiotherapy Department, Bournemouth University

AIMS

To provide comprehensive assessment, diagnosis then deliver rehabilitation & self-management strategies for rotator cuff related shoulder pain (RCRSP), negating need for follow-up.

Background and objective:

- Significant MSK Physio waiting list pressures required innovative action.
- Evidence from GRASP (2021) supported piloting a service development to deliver best practice advice with exercise prescription from BU Physio colleagues.

Methods:

- 21 patients identified from waiting list with RCRSP, attended for formal assessment and prescription of progressive exercises from a pre-determined program.
- Rehabilitation taught by pairs of voluntarily recruited 2nd year BU Physio students.
- Students required prior training & supervision throughout by BU tutor and UHD exercise leads, ensuring scope of practice.
- 3 patients received cortico-steroid injections (CSI).
- All patients completed SPADI (Shoulder Pain and Disability Index) and EQ5D & facilitated to self-manage following best practice rehabilitation guidance and advice.

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Results:

- 15 of 21 patients contacted 6-8/52 post clinic
- **SPADI** Improved by 12%
- **EQ-5D** Improved from 41% to 37%
- 23.8% Follow up rate (saving 40 contacts)

Conclusions:

- Overall improvement; SPADI, EQ-5D & Follow Up <30%.
- Model already evolved to wider inclusion criteria and learning integrated into BU program.
- Students gained valuable experience and placement hours.
- Future proposals could integrate with Orthopaedic ASD waiting list.

Limitations:

- Low initial numbers and short term follow up data. Longer term outcomes required and comparison between RCRSP with wider inclusion criteria.

Reference:
Hopewell, S et al., (2021) Progressive exercise compared with best-practice advice, with or without corticosteroid injection, for rotator cuff disorders: the GRASP factorial RCT. *NIHR Journals Library. 25 (48).*

A double-blind placebo-controlled randomised crossover trial to evaluate brown fat quality, quantity and activation with inorganic nitrate supplementation in people with type 2 diabetes mellitus

Neal R[(1)]., Shepherd A[(2)], Velan S[(3)] *et al*.

[1]Bournemouth University; [2]University of Portsmouth; [3]Singapore Bioimaging Consortium

Contact: rneal@bournemouth.ac.uk

Aim

Investigate whether 14-days of **dietary nitrate supplementation** is effective at **increasing brown adipose tissue** (BAT) quantity and activation in individuals with type two diabetes mellitus (**T2DM**).

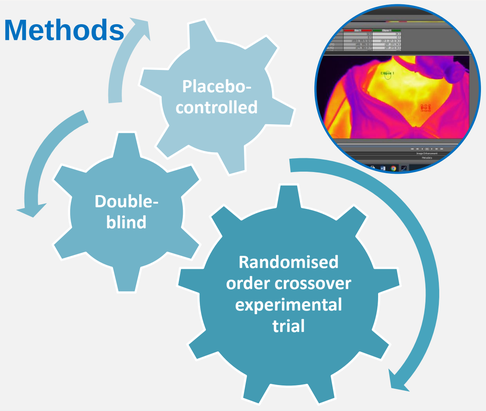
Primary objective

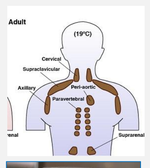
- O_1: To assess the effect of 14-days of dietary nitrate supplementation on BAT **quantity** via Magnetic Resonance Imaging (**MRI**) in individuals with T2DM

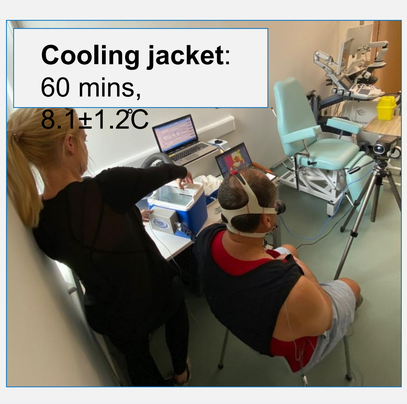
Secondary objectives

- O_2: To assess the effect of 14-days of dietary nitrate supplementation on BAT **activation** via infra-red thermography (**IRT**) in individuals with T2DM
- O_3: To assess the effect of 14-days of dietary nitrate supplementation on **biomarkers** including **nitrate** and **nitrite** concentration and cyclic guanosine monophosphate [**cGMP**] in individuals with T2DM.

Methods







Primary outcome

Figure 1: Proton density fat fraction image of supraclavicular fat depot in an adult with T2DM.

Secondary outcome

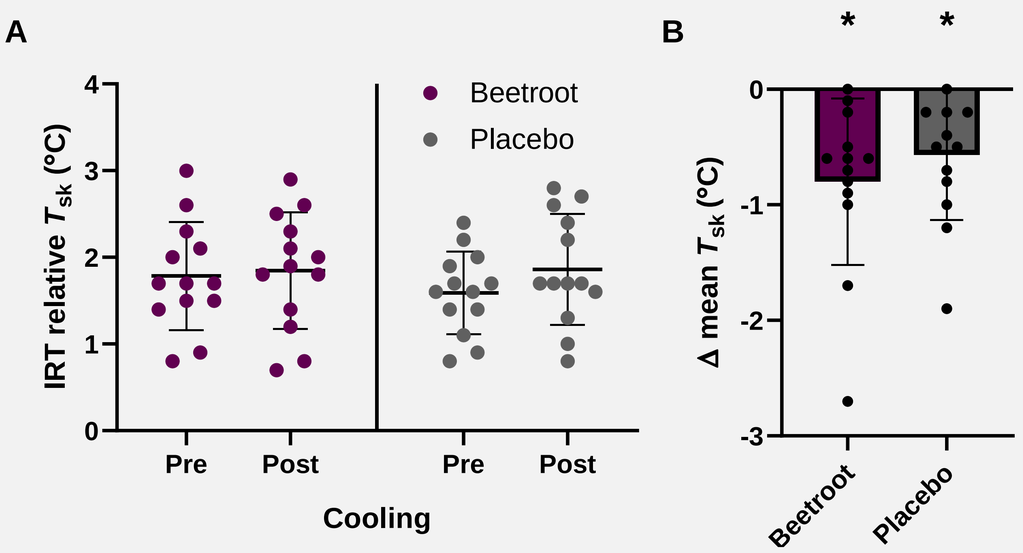


Figure 2. **A**: Skin temperature (above the supra-clavicular region relative to sternum control site) measured with IRT pre- and post-cooling following placebo (grey) or beetroot intervention (purple). **B**: Change in mean skin temperature following 60 mins cooling with water perfused jacket after placebo and intervention. *denotes change pre- to post-cooling ($P<0.05$)

Summary

- O_1; O_3: The results for the effect of nitrates on brown fat quantity via **MRI**, and **biomarker** responses, are expected June-July 2023.
- O_2: Dietary nitrate supplementation does not increase brown fat activation quantified via **IRT**. Possible explanations for the lack of effect include 1) an insufficient cooling protocol, 2) the IRT measurements of relative skin temperature may be insufficient to elucidate potential changes in brown fat activation or, 3) that nitrate does not increase BAT in people with T2DM.

Can a Purposeful Walk Intervention with a Distance Goal using a Commercially Available Activity Monitor Improve Individuals' daily activity and function Post Total Hip Replacement Surgery

Shayan Bahadori[1,4], Jonathan Mark Williams[2], Sarah Collard[3], Ian Swain[1]

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2. Faculty of Health and Social Science, Bournemouth University, Bournemouth, Dorset, UK.
3. Faculty of Science and Technology, Bournemouth University, Bournemouth, Dorset, UK.
4. Presenting Author.
5. BU-UHD Research Event, 24th May 2023.

Background

Total hip replacement (THR) is one of the most common orthopaedic surgeries that occur in the United Kingdom (UK) each year. However, a recent study monitored the recovery post THR and data showed that the number of steps after THR decreases temporarily after surgery and does not reach the same level as before surgery, even after 12 months.

Aim

This randomised pilot trial aimed to determine the effect of an intervention where walking distance is used as a goal to increase daily walking activity using a commercially available activity monitor in THR patients 3 to 6 months post-surgery.

Methods

The 5 weeks long intervention was compared against a control group who reported their daily steps as opposed to a daily distance outdoor walk. Data were collected on gait, hip-related subjective outcome measures (Hip Disability and Osteoarthritis Outcome Score (HOOS) questionnaire), and the effects of the Fitbit Charger 4 (FC4) activity monitor as an assistive device on functional independence, well-being, and quality of life (Psychosocial Impact of Assistive Devices Scale (PIADS) questionnaire).

Results

The Cohen's effect size were larger for the changes in the data for gait, HOOS, and daily walking amount in the intervention group in contrast to the control group. The PIADS subscale for competence, adaptability, and self-esteem, were better in the intervention group by more than 50% in contrast to the control group. A sample size calculation was carried out for walking distance based on the effect size of 1.27 from this pilot study, with alpha at 0.05 and power at 90%, a sample size of 24 is required.

	Intervention			Control			Between group
	M_D	SD	d	M_D	SD	d	d
Walking	104.68	60.98	1.72	-9.80	25.08	-0.39	1.27
Step length (m)	0.11	0.11	0.98	0.03	0.07	0.47	0.87
Walking speed (m/s)	0.25	0.23	1.06	0.09	0.11	0.79	0.89
Cadence (stride/min)	2.96	5.53	0.54	3.80	5.83	0.65	-0.15
HOOS	17.68	15.12	1.17	5.12	3.81	1.34	1.14

Table 1. Within group and between group mean difference (pre to post intervention) (MD), standard deviation (SD), and the Cohen's effect size (d).

Conclusions

Findings suggested that the participants in the purposeful intervention group had higher activity levels after THR, compared to participants who were in the control group. However, further research with a larger sample size is required to provide tangible evidence on the significance of the effect of the purposeful walk in contrast to step count.

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CycLing and EducATion (CLEAT): protocol for a single centre randomised controlled trial of a cycling and education intervention versus standard physiotherapy care for the treatment of Hip Osteoarthritis

Wainwright TW[12], Immins T[12], Docherty S[2], Goodwin E[3], Hawton A[3], Low M[1], Samways J[1], Rees T[2], Saunders G[4], , Middleton RG[12]

1. University Hospitals Dorset, Bournemouth, UK
2. Orthopaedic Research Institute, Bournemouth University, Bournemouth, UK.
3. University of Exeter, Exeter, UK
4. University of Southampton Clinical Trials Unit, Southampton, UK

BU-UHD Research Event 24 May 2023 - Collaborative Research: A Time for Action

Background

Osteoarthritis (OA) is a chronic degenerative joint disorder for which there is no known cure. Non-surgical management for people with mild-to-moderate hip OA focuses mainly on alleviating pain and maximising function via the National Institute for Health and Care Excellence (NICE) recommended combination of education and advice, exercise, and, where appropriate, weight loss. The CHAIN (Cycling against Hip pAIN) intervention is a group cycling and education intervention conceived as a way of implementing the NICE guidance.

Methods

Cyc**L**ing and **E**duc**AT**ion (CLEAT) is a pragmatic, two parallel arm, randomised controlled trial comparing CHAIN with standard physiotherapy care for the treatment of mild-to-moderate hip OA. We will recruit 256 participants referred to the local NHS physiotherapy department over a 24-month recruitment period. Participants diagnosed with hip OA according to NICE guidance and meeting the criteria for GP exercise referral will be eligible to participate. Primary outcome is the difference in Hip Disability and Osteoarthritis Outcome Score (HOOS) function, daily living subscale between those receiving CHAIN and standard physiotherapy care.

Secondary outcomes include performance-based functional measures (40m walking, 30s chair stand and stair climb tests), ability for patient to self-care (patient activation measure) and self-reported health-related resource use including primary and secondary care contacts. The primary economic endpoint is the number of quality adjusted life years (QALYs) at 24 weeks follow-up. The study is funded by the National Institute for Health Research, Research for Patient Benefit PB-PG-0816-20033.

Discussion

The literature identifies a lack of high-quality trials which inform on the content and design of education and exercise in the treatment of patients with hip OA and explore cost-effectiveness.

CLEAT is a pragmatic trial which seeks to build further evidence of the clinical benefits of the CHAIN intervention compared to standard physiotherapy care within a randomised, controlled trial setting, and examine its cost-effectiveness.

This work is funded by the National Institute for Health Research (NIHR) under its Research for Patient Benefit (RfPB) programme (Grant Reference Number PB-PG-0816-20033). UHD are the trial sponsors.

Impact

The results of this work will be highly impactful. It will be one of the largest RCT's in this clinical area, and one of the very few with clinical and economic endpoints. It is therefore highly likely that the findings will influence future NICE guidance and clinical practice.

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Short-term (3-months) functional outcomes following robotic total hip replacement surgery: a cohort study

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2. 2. Nuffield Health, Bournemouth, UK

BU-UHD Research Event 24 May 2023 - Collaborative Research: A Time for Action

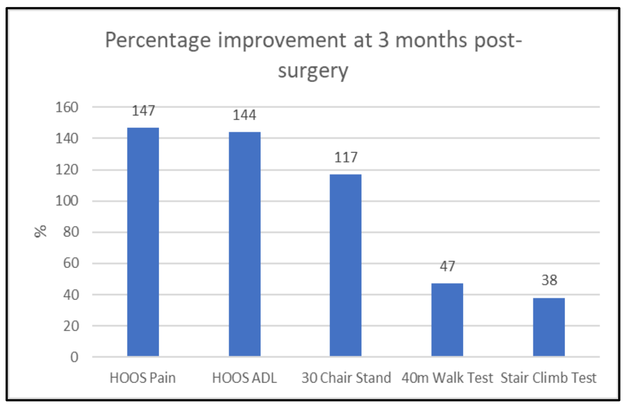
Background

There is increasing evidence that robotic hip replacement surgery may increase the accuracy of component positioning compared to manual surgery and accelerate recovery after surgery. Evidence from manual hip replacement studies indicates that there is often a discrepancy between Patients Reported Outcome Measures (PROMs) and objective performance-based assessments, highlighting the need to establish a baseline for objective performance-based recovery. This prospective observational study presents performance-based and PROMs outcomes up to 3 months following surgery for robotic hip replacement patients.

Methods

A favourable ethical opinion was obtained, and the study was prospectively registered. Recruitment was consecutive and non-selective between July 2019 to March 2020. All patients were operated on at an independent hospital using the Mako Total Hip 4.0 Robotic-Arm Assisted System, with an Exeter Stem and Trident Acetabular Shell System, using a posterior approach. Performance-based functional tests and PROMs were assessed by the study team prior to surgery, and again at 3 weeks, 6 weeks and 3 months. The PROM was the Hip Disability, and Osteoarthritis Outcome Score (HOOS) collected at baseline, 3 weeks, and 3 months. The functional assessments were the 30s Chair Stand, the 40m fast-paced walk and the 9-step Stair Climb tests.

Results



Seventy-eight patients completed follow-up. Thirty-two patients were male, mean age 71.8yrs, mean BMI 27.2, mean pre-surgery HOOS Pain 45, and HOOS ADL 46. At 3 months follow-up, HOOS pain scores improved by 147%, HOOS ADL scores improved by 144%, the 30s Chair Stand Test improved by 117%, the 40m fast-paced walk test improved by 47%, and the 9-step Stair Climb test improved by 38%.

Conclusions

This is the first prospective study to report functional performance after robotic hip replacement, including both PROMs and performance-based assessments. At 3 months post-surgery, functional performance improved markedly and was favourable in comparison to established literature for manual hip replacement.

Impact

Total hip replacement is reported as one of the most successful operations and is performed in an increasing number of patients every year globally. However, there is an ongoing need to improve surgical technique so optimal component position is achieved, and surgery-related complications are reduced.

This research will increase the understanding of how robotic hip replacement surgery may impact on these complications and readmissions, and on patient outcomes in the three months following surgery. It will help to establish baseline measures of performance-based assessments post-surgery and contribute to the evidence-base considered by healthcare organisations in their adoption of the technology.

This study is funded by Stryker and sponsored by Bournemouth University.

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A strengthening and exercise programme, using strength of bodyweight ratios, for the treatment of knee osteoarthritis: A quality improvement study

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2. Orthopaedic Research Institute, Bournemouth University, Bournemouth, UK.

BU-UHD Research Event 24 May 2023. Collaborative Research: A Time for Action

Background

The Kneefit programme is a 12-week strengthening and exercise programme, personalised using body weight ratios, for people with knee osteoarthritis.

Objectives and Design

This quality improvement study was conducted to evaluate the effectiveness of the programme for managing symptomatic knee osteoarthritis by evaluating patient reported outcome measures (PROMs) and lower limb strength before and after the programme

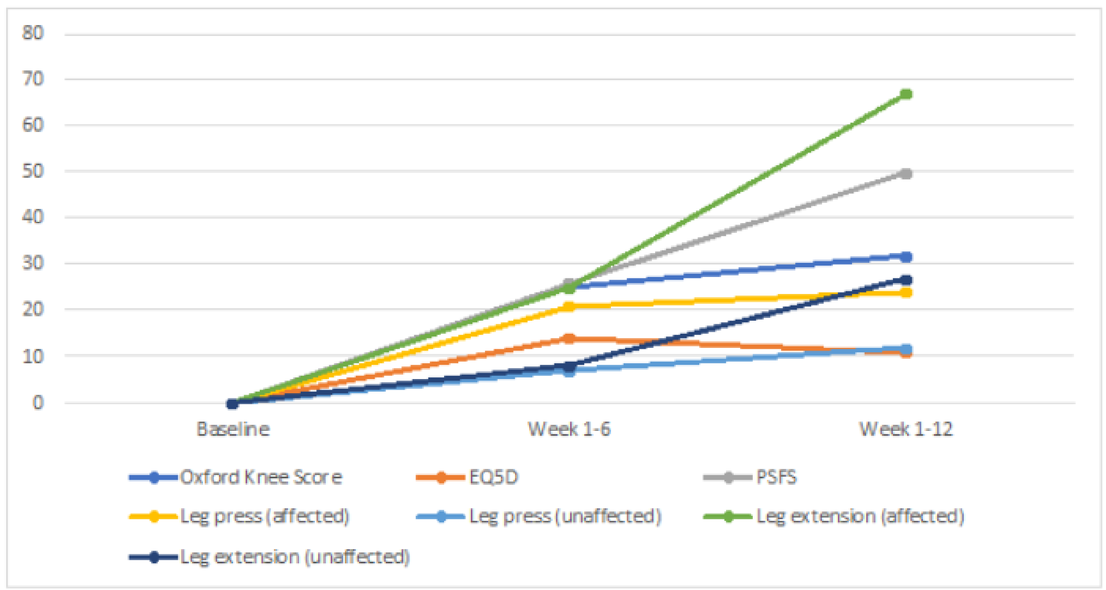

Figure 3. Percentage change in outcome from baseline to week 1 and 12.

Methods

The Kneefit programme was delivered between 20th August 2013 and 7th January 2014 and included six weeks of supervised strengthening, balance, and cardiovascular exercise in a group at the local hospital, followed by six weeks of unsupervised exercise. Patients were assessed at baseline, six weeks, and twelve weeks.

Results and Conclusions

Thirty-six patients were included at baseline and six weeks, and 31 patients completed their twelve-week assessment. Statistically significant improvements were found at 6 and 12 weeks for change in Oxford Knee Score (median change: 4.0, IQR 4.0 to 9.0, $p < 0.001$ and 4.0, IQR 0 to 8.0, $p < 15\ 0.001$), EQ5D-5L (median change: 0.078, IQR 0.03 to 0.20, $p < 0.001$ and 0.071, IQR 0.02 to 0.25, $p < 16\ 0.001$) and the PSFS (median change: 1.3 IQR 0 to 2.6, $p = 0.005$ and 2.3 IQR -0.3 to 3.3, $p = 0.016$). In addition, significant improvements were found for 1RM leg press and knee extension scores on both the affected and unaffected leg.

The Kneefit programme was successful at improving both functional and strength related outcome measures in patients with knee osteoarthritis. Our findings suggest that tailoring strength exercise based on 1RM strength training principles is feasible in this population.

Impact

Findings from this study suggest that tailoring strength exercise based on the 1RM strength training principles is feasible in this population. Future work will involve developing the Kneefit programme to include an educational component and an advanced home exercise programme, and further evaluations of the study will compare the programme to global models of care so that its impact on patient outcomes can be further assessed.

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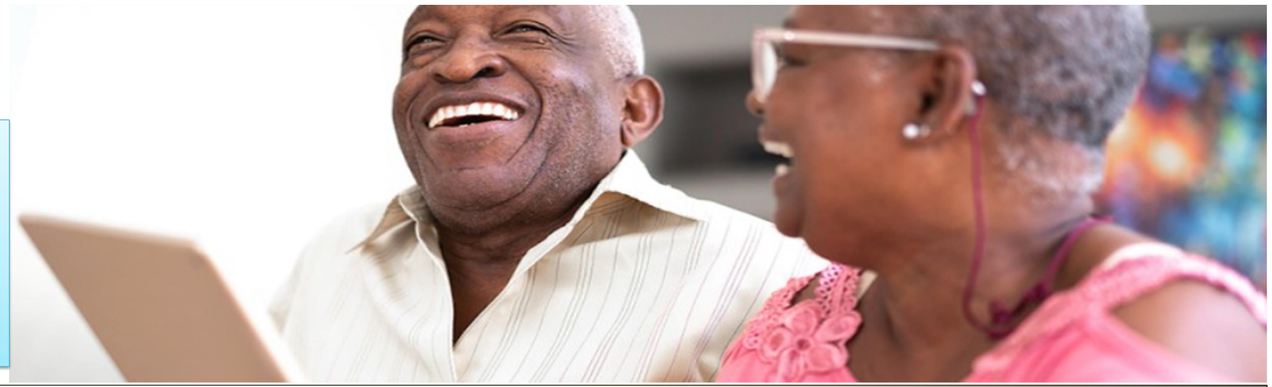
NIHR | Applied Research Collaboration Wessex

DIgitAL cOaching for fRailty (DIALOR)



Introduction

DIALOR is an acceptability & feasibility study, developing an intervention to support older adults (aged ≥65 years) using personalised digital health coaching (HC) & digital technology (my mhealth) to manage symptoms of frailty & other long-term conditions

The problem

21% of the Wessex population aged ≥65. Older adults with frailty have increased risk of poor health, functional decline & mortality (Clegg, A., et al. 2013). Multi-domain interventions appear to offer an opportunity to prevent, delay, or reverse existing symptoms of frailty (Anton et al., 2015; Cameron et al., 2017; Walters et al., 2017 Serra-Prat et al., 2017; Yu et al., 2020)

Intervention

12 weeks HC and 6 months use of the digital platform with pre-post data addressing frailty severity and 4 key domains:

- Physical activity
- Social engagement
- Nutrition
- Psychological wellbeing

Outcomes

Primary – Acceptability and feasibility of the DIALOR intervention
Secondary – Measurement of pre-post data using validated outcome measures, use of digital technology using inbuilt tracking data as well as self-reported indicators

Methods

Single group, non-randomised, pretest/post-test study, using qualitative and quantitative methods consisting of two sequential work packages (WP) within primary care

WP 1- Systematic review and narrative synthesis, interviews with older people with mild-moderate frailty (n=20), and their carers, and focus groups (n=4) with health care professionals (HCPs) and health coaches (n=20) (key stakeholders), co-production of intervention with stakeholder engagement and patient and public engagement groups

WP 2 – Intervention and trial feasibility (n=50), semi-structured interviews with participants (n=20), and their carers, and HCPs and health coaches (n=20)

Preliminary findings

- Lack of primary research about effect(s) of combined digital health interventions (DHIs) for optimal frailty and LTC management
- Poor understanding and negative stigma associated with the term ‘frailty’ amongst older adults
- Importance of ‘human element’ with DHIs, aiding compliance towards health behaviour change

Future dissemination

Dissemination to academic communities, healthcare sectors, and interest communities via publishing, conferences & project advisory groups. For more information about the study, please visit our dedicated website via the QR code:

University of Southampton

help&care

my mhealth Changing Healthcare Forever

NHS University Hospitals Dorset NHS Foundation Trust

NHS Dorset HealthCare University NHS Foundation Trust

Wessex Academic Health Science Network

Reducing the incidence of hyponatraemia following total hip replacement

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BU-UHD Research Event – Collaborative Research: A Time for Action 24th May 2023

Background

Hyponatraemia is a common complication following total hip replacement. These patients have a number of risk factors all of which reduce their ability to excrete excess water. In addition, SIADH (syndrome of inappropriate ADH secretion) is a frequent consequence of major surgery, which causes water retention and salt loss in the kidneys.

Objectives

Following surgery patients are typically encouraged by healthcare professionals to “drink plenty”, in the belief that this is a good thing to do.

In an attempt to reduce the incidences of hyponatraemia we introduced a policy of limiting oral fluid intake after surgery.

Methods

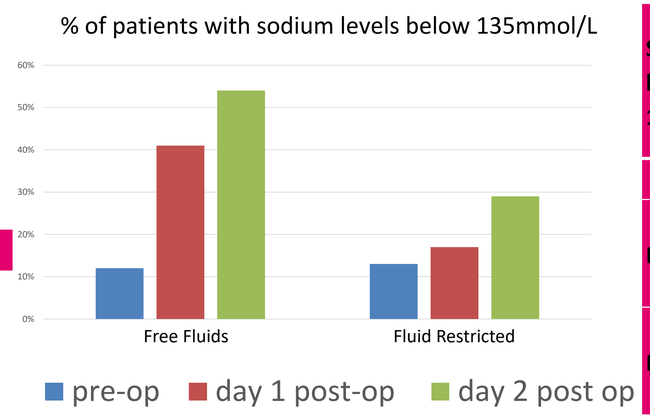
We did an initial survey of 204 patients, taking blood for biochemistry on days 1 and 2 post-operatively. Patients were allowed to drink freely from the time of surgery. If their sodium on their day 1 was <135mmol/L, they were fluid restricted to 1000ml of oral fluid intake per day.

The subsequent 76 patients were fluid restricted to between 750-1000mls/day immediately after surgery but where the fluid restriction was then lifted if their blood test on day 1 showed a sodium >135mmol/L.

Results

- The incidence of day 1 hyponatraemia during the initial survey was 42%. Introduction of early fluid restriction brought about a 60% reduction in hyponatraemia.

- We found that age and female gender are significant risk factors. Overall patients renal function improved with fluid restricted, which was not expected. However the number of cases of acute kidney injury (AKI) was higher with fluid restriction.



Sodium levels below 135mmol/L	Pre-op		Day 1 post - op		Day 2 post-op	
	male	female	male	female	male	female
Free Fluids	12%	12%	28%	48%	34%	65%
Fluid restricted	12%	14%	12%	20%	28%	29%

Conclusions

Avoiding over hydration of patients after surgery reduces the incidences of hyponatraemia. Contrary to popular belief, drinking excessive amounts of water actually reduces renal function. We speculate that the increase in the incidence of AKI was the result of using a blanket 1000ml fluid restriction regardless of patient size giving scope for refinement.

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Audit showing patient satisfaction of Total Hip Replacement wound dressings

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24th May BU-UHD Research Event – Collaborative Research: A Time for Action

Background

Wound care following THR surgery plays a vital role in the patients recovery. Despite advances in surgical technique and the implementation of ERAS protocols, complications related to the incisional wound can still occur.

Given the success of ERAS protocols in reducing hospital LOS, patients are now being routinely discharged 1-2 days after total hip replacement (THR). Therefore, empowering patients through education so that they are comfortable to self-manage their surgical incision after discharge is vitally important in the early detection of post-discharge SWCs.

Objectives

To audit the impact and effectiveness, comfort and current dressings used have on the patients recovery and satisfaction, in addition to the level of information given on discharge for wound care education.

Study Design and Methods

Despite advances in surgical technique and the implementation of ERAS protocols, complications related to the incisional wound can still occur.

Given the success of ERAS protocols in reducing hospital LOS, patients are now being routinely discharged 1-2 days after total hip replacement (THR). Therefore, empowering patients through education so that they are comfortable to self-manage their surgical incision after discharge is vitally important in the early detection of post-discharge SWCs.

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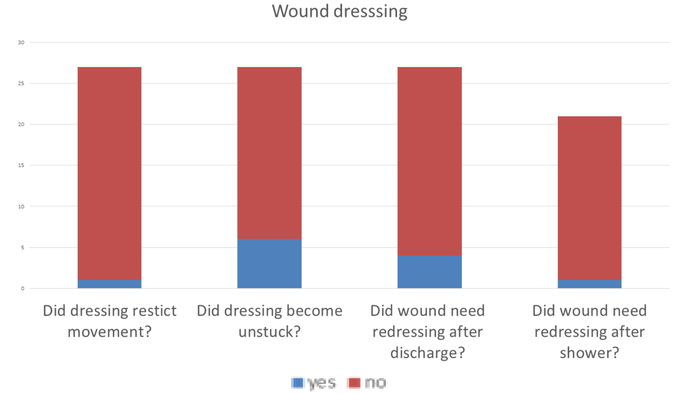
Results

From Dec 2022 – Jan 2023, 30 pts completed the audit. 96% of patients said the dressing did not restrict their movement or pull on the skin at all, and further to this no patients reported developing any blisters because of the dressing. Of the 77% of patients who showered while the dressing was in place (average of 4.8 showers per patient), 95% did not need the dressing changing afterwards. 92% said it wasn't uncomfortable to be removed. 85% felt they understood how to look after their wound at home and 77% felt they were given enough information. 96% were given post-discharge contact information for any wound queries, however, all patients confirmed they were not given any nutritional or lifestyle factors to consider regarding their wound healing at the point of discharge.



Conclusions

In this snapshot audit, there were no post-discharge SWCs and patients reported that movements and activities such as showering was unrestricted by their dressing. There was excellent compliance to the ISWCAP patient self-care checklist in all domains except for the absence of any lifestyle and nutrition information given to patients in relation to wound care. This may highlight an area for future improvement or may also signify that for pts on an THR ERAS pathway this information is not essential. The development of procedure specific checklists may therefore be beneficial in the future.

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Positive effects of cold-water immersion on mood and brain activity

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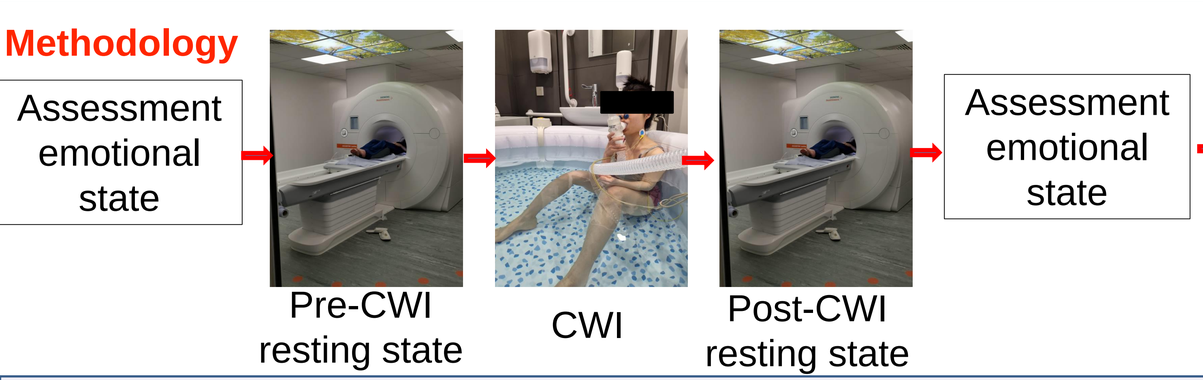
Biology, 2023, *12*(2), 211. https://doi.org/10.3390/biology12020211

Background: An emerging body of evidence indicates that regular swimming in cold water reduces fatigue, lessens depressive symptoms and improves general well-being. However, we do not know what the immediate effects of cold-water immersion (CWI) are:

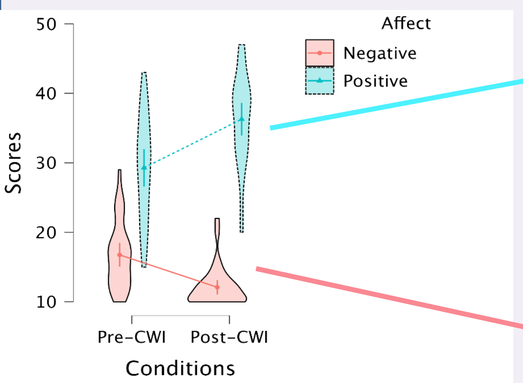
- *Does CWI increase positive mood or decrease negative emotions?*
- *What are the neural mechanisms of the mood facilitation effects after CWI?*

Methodology

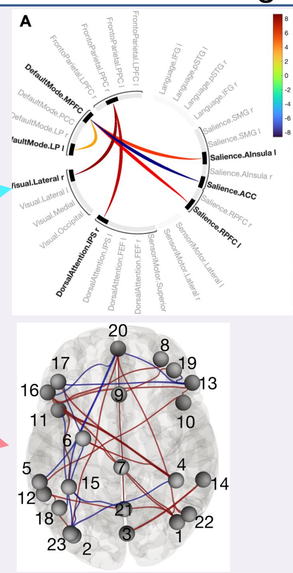


Results

Increase in positive emotions



Decrease in negative emotions



Active, attentive, proud

A unique component of interacting networks: Default Mode Network, Frontoparietal Network, Anterior Cingulate, Salience Network and Visual Lateral Network

Less nervous and distressed

Distributed ('background') connectivity

Discussion

-People felt more active, alert, attentive, proud, and inspired and less distressed and nervous after having a cold-water bath;

-Following cold water immersion there was consistency in the observed changes in positive affect and brain connectivity

-Changes in positive emotions were associated with coupling between brain areas involved in attention control, emotion, and self-regulation.

Learning points

This was a collaborative study performed between 2 universities and an NHS trust

It was supported by internal research funding from Bournemouth University for scanner time

Whilst questionnaires can describe the emotions elicited by in this case cold water stimuli, fMRI offers a unique visual representation of the underlying neurophysiology

Next steps

CWI as a drug-free, self-sustained, low-cost and accessible way of reducing depressive symptoms

-Evaluate the immediate effects of CWI on emotional state and neural responses in people with depression.

-Assess immediate psychobiological effects of CWI in people with depression.

-Test long-term effects of CWI on mental health conditions in people with depression

Immune response in Waldenström Macroglobulinaemia patients after BTK inhibition

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Background

The bone marrow tumour microenvironment (TME) in Waldenström Macroglobulinaemia (WM) has been shown to have a role in WM disease progression and therapy resistance, however the effect of BTK inhibitors (BTKi) on the TME has been under explored. BTK is an essential element of the B-cell receptor (BCR) signalling cascade and plays an important role in pathways that regulate tumour microenvironment interactions.

Aims & Methods

The aim of this study was to evaluate the immune microenvironmental changes in the bone marrow, following BTKi treatment in WM and correlate with molecular profiling.

- A targeted gene expression assay was performed using the Oncomine™ Immune Response Research Assay (ThermoFisher Scientific) to interrogate 395 genes involved in the TME (figure 1)

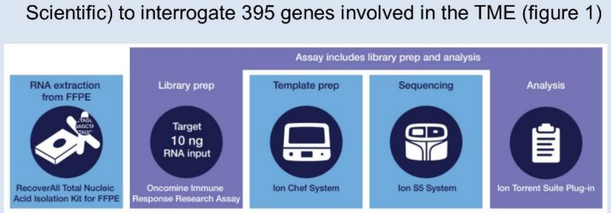


Figure 1. *Workflow for Oncomine Immune Response Assay using the automated library preparation system (Ion Chef), and purpose built Affymetrix™ Transcriptome Analysis Console software plug in for streamlined sample analysis (ThermoFisher Scientific)*

- RNA was extracted from FFPE bone marrow trephine biopsies for 31 samples from 15 patients plus 1 control. Each patient has a sample prior to BTKi treatment and 12 months after starting BTKi treatment. Correlation with existing *MYD88* mutation status was performed and differential analysis between the two time points was performed using the Affymetrix™ Transcriptome Analysis Console software.

Table 1 – Summary: Patient (n=15); Sample (n=31)	
Male/Female	11/4
Median age at diagnosis	70
No. of *MYD88*^{L265P} positive cases	10
No. of patients pre-treated before BTKi	11
Median follow up in months (range)	119 (27-249)
No of patients still on BTKi treatment	6
Patient response >MR at 12 months BTKi	15
Type of BTKi treatment:	
Ibrutinib	5
Acalabrutinib	8
Zanubrutinib	2
Median BTKi treatment length in months (range)	43 (6-72)

Results & discussion

Of the 14 samples (7 pre, 7 post) that passed the quality control threshold for this analysis, there were 9 *MYD88*^{L265P} positive samples and 5 *MYD88*^{L265P} negative samples.

Comparative analysis of *MYD88*^{L265P} positive samples before and after BTKi treatment, showed upregulation of genes involved in the lymphocyte infiltrate pathway, checkpoint pathway and NK cell markers. There was downregulation of genes associated with type 2 interferon signalling and TCR coexpression (figure 2).

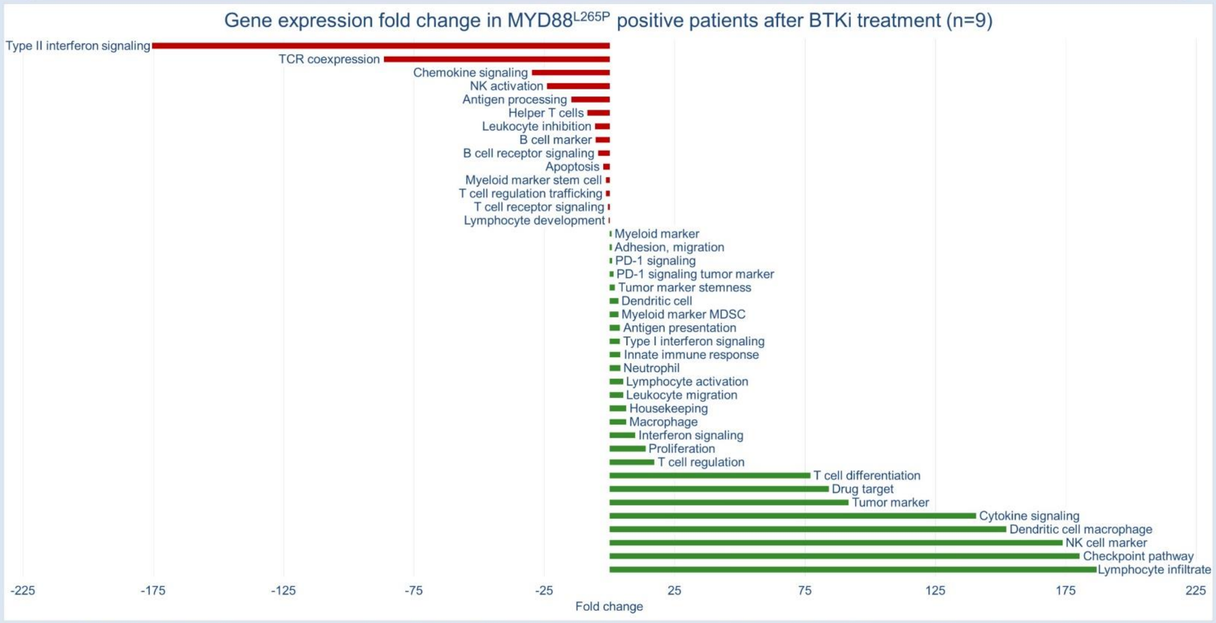


Figure 2. *Fold change in gene expression after BTKi treatment, after comparative analysis of the pre (5) and post (4) samples in the MYD88*^{L265P} *positive cohort. Labelled functional annotation groups show the downregulated (red) and upregulated (green) pathways*

Comparative analysis of all *MYD88*^{L265P} positive pre (5) and post (4) BTKi samples showed significant differences within the type 2 interferon signalling pathway, checkpoint pathway and T cell receptor pathway with the most significant upregulation in NK cell marker, *NCR1* and downregulation of *CXCL13* post BTKi (figure 3).

The analysis of *MYD88*^{L265P} negative pre (2) and post (3) BTKi samples did not show the same pattern in terms of gene expression, but instead showed an upregulation of B cell marker, *CD22*, and a downregulation of *IFNG* and *CXCL11* in the type 2 interferon signalling pathway.

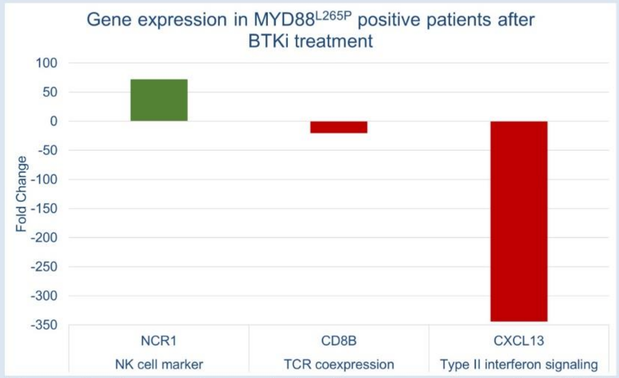
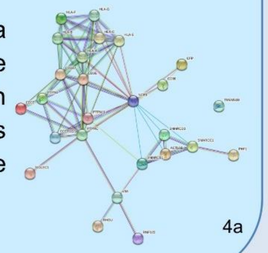


Figure 3. *Comparative analysis of gene expression by MYD88 mutation status, pre vs post BTKi, and treatment type showing the fold change in gene expression between pre (5) and post (4) BTKi treatment for MYD88*^{L265P} *positive patients, all with a significant p-value of 0.03. BTKi treatment types in the positive cohort include acalabrutinib (4 patients), zanubrutinib (1 patient) & ibrutinib (1 patient).*

***NCR1*:** Differential expression of *NCR1*, which encodes for a cytotoxicity-activating receptor on NK cells, has not previously been associated with Waldenström macroglobulinaemia but is consistently upregulated post BTKi in our cohort.

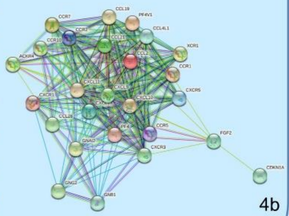
NCR1 is found on the plasma membrane and in the nucleus and interacts with T cell surface glycoproteins within the adaptive immune response (figure 4a).



4a

***CXCL13*:** Downregulation of *CXCL13*, previously shown to be produced by LPL cells, was predominantly seen in our cohort in patients treated with acalabrutinib.

CXCL13 is mostly found in the extracellular space, acting as a B lymphocyte chemoattractant, interacting with other chemokines and chemokine receptors from many signalling pathways (figure 4b).



4b

Conclusions & Future work

* This pilot study has shown regions of the WM immune microenvironment with significant changes in gene expression after BTKi therapy, namely in pathways involving NK cells and type 2 interferon signalling.
* A larger cohort with paired samples, pre and post BTKi treatment, is warranted.

Acknowledgements & References
There are no relevant conflicts of interest to disclose. Many thanks to Dr Zadie Davis for scientific support, guidance and training and to Dr Helen McCarthy for clinical support.

How the clinical research role at UHD captured our career in the NHS: our lived experience

Pablo Pule (Cardiac Research Nurse), Lucy Stainer (Senior Lecturer & Cardiac Research Nurse)

Bournemouth University

University Hospitals Dorset NHS Foundation Trust

What the research role offers

Time with patients & high-quality patient care
New skills i.e. centrifuging, blood smears
Advance & development of new drugs, devices & care pathways
Leadership & management
Working with different multi-professional teams
Extending our clinical and research skills & knowledge
Participating in changes to clinical practice, and service development by integrating trial findings
Managing a portfolio of clinical trials
Providing ongoing education, advice & information to patients & their loved ones
Achievement of recruitment targets & timelines
Adhering to the data management process
Flexible & adaptable to help other research specialities
"…each day is a different day and provides autonomy, excitement and satisfaction"

Future horizon

Seeking nurse-led research projects
Work with research centres at BU: collaboration
Continue to advance our research & clinical skills
Future publications and presenting at conferences
Promoting research culture

Research to support collaboration: 4 themes

1. Collaboration combines academic and clinical expertise, enabling researchers to design studies that are more relevant to clinical practice and implement interventions readily translated into practice (Gagliardi et al 2019).

2. Collaboration improves patient outcomes: provides more effective interventions and treatments (Wijayasinghe et al 2020).

3. Collaboration strengthens research capacity: provides opportunities for researchers to learn from clinical practice and for clinicians to learn from research, develop new research skills and adopt evidence-based practices in clinical settings (Lai et al 2017).

4. Collaboration enhances the translation of research findings: by involving clinicians in the research process and designing feasible interventions to implement in clinical settings (McLeod et al 2018).

Participants Voices

Participants in the Research Experience Survey (PRES) at UHD 2022/23 survey

- 92% of participants would take part in research again

Feedback included:

'I was made to feel part of an invaluable clinical research helping with the fight against covid'

'The thought that this will help to diagnose others in the future.'

'Help to find out more about the condition and how to treat it.'

'The staff were fantastic, kind and considerate in every way. Good to feel that you were helping even in just a small way.'

UHD Research Team: their role creates for them….

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Complex Clinical Reasoning
Multiprofesional elearning tailored to complex clinical reasoning in practice

Background

• The Complex Clinical Reasoning elearning programme has been designed for clinicians working along the continuum of enhanced to advanced practice, who want to learn about the complexities of clinical reasoning.

• This programme is designed to work in parallel with supervision in practice for developing clinical reasoning skills in both the elearning and clinically based components of the programme's learning. The clinically based component requires a supervisor to support clinical reasoning within the context and environment of the learner's clinical practice. The elearning sessions aim to provide a supportive educational environment which can be followed up in practice, however the sessions are not meant to be exhaustive.

• One of the challenges of delivering this is how varied clinical roles and environments are from diverse professions such as AHPs, nurses, and pharmacists who not only have very different roles but also clinical contexts and educational histories. Writing the programme this way allows the educational content to be introduced by elearning and shaped by practice.

Programme overview

•The nine elearning modules can be completed at any time-frame and are mapped to Multi-Professional framework for advanced clinical practice in England. The supervisor guide will support the educator through the process and is bolstered by additional learning material such as podcasts, literature and learning activities.

- Principles of clinical reasoning.
- Exploration of the normative and narrative accounts.
- Adding layers of complexity – adding social and historical contexts.
- Clinical decision making – the theory in practice.
- Balancing the analytical process.
- Mutliprofessional clinical reasoning.
- Movements in clinical reasoning – from evidence based medicine to clinical mindlines.
- Philosophical considerations in clinical reasoning.
- Ethical considerations in clinical reasoning.

Supervisor Guide

• **Team:** Matthew Low, Dr Tim Noblet, Julia Taylor, Amanda Hensman-Crook, Charlotte Devereaux, Moz Cammack, Steve Gibbons, Tracy Watkins, Rishi Chavda, Louise Garrahan, Dr Neil Langridge, Dr Samantha Copeland, Aimee Robson, Dr Emma Hyde, Dr Oliver Thompson, Jodie Smith.

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Collaborative research: A time for action

An evening of research collaboration and networking for BU and UHD staff.

24 May 2023, 4-8pm
Bournemouth Gateway Building, Lansdowne Campus

Thank you to all who contributed

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