

Institution: AECC University College
Unit of Assessment: 03 Allied Health Professions, Dentistry, Nursing and Pharmacy
1. Unit context and structure, research and impact strategy 1.1 Context <i>1.1.1 AECC University College as a Higher Education Institution</i> AECC University College was designated as a Higher Education Funding Council for England funded institution in March 2016. Subsequently, in May 2016, we were awarded Taught Degree Awarding Powers (TDAP) admitting all new students to our own degrees from September 2017, the same year we received our University College title. AECC University College has not taken part in the Research Excellence Framework exercise at any time previously and is only submitting one Unit of Assessment. Elements of this submission necessarily therefore comprises a description of the University College research environment as a whole, comprising as they do, central components of the environment upon which the Unit of Assessment is predicated. Hence the research and impact strategies articulated here are at an institutional level where a new institutional focus of building institutional research capacity, activity and output is centred. AECC University College mission is <i>A healthier society through education, research and clinical care</i> which is underpinned by our institutional strategy. The institution is dedicated to excellence in education, clinical training, and research. We have a unique history and are proud of our heritage within the field of musculoskeletal healthcare noting our considerable recent investment in expanding our educational offering within the field of health sciences. AECC University College is a Specialist in Health Sciences institution and offers undergraduate and post graduate training in a number of Allied Health or registered health professions. The institution consists of three academic schools. These are the School of Radiology, the School of Psychology, Sport and Physical Activity and the School of Chiropractic. The University College currently offers seven undergraduate courses and 12 postgraduate courses, including pre-registration programs for health professionals. We also offer a range of continuing professional development courses to support healthcare professionals. In 2019-20 our total consolidated income was £9.16m with 202 employees comprising 50 Academic staff and 96 Professional Staff. As of 2018-19 our total student numbers comprised 777 registered students. <i>1.1.2 Institutional Strategy</i> The institution has undergone considerable change since gaining its designated higher education institution status, where the focus on research activity, output, and funding has shifted significantly as we transitioned fully into our new position. We have recently (2017/18) expanded into 3 schools and appointed new executive level staff at Vice Chancellor (<i>Professor Lesley Haig</i>) and Deputy Vice Chancellor (<i>Professor Kevin McGhee</i>) who bring a renewed focus on building research activity and capacity building. From our institutional level strategy, we developed an internal Research Strategy (2018-2021), which focused on development of an institutional research culture. We envisaged that our research would broadly focus on addressing existing and emerging health challenges in our community and society at large and would seek to contribute to supporting better health for all. Such research would also serve to centrally inform and drive the programs of study we deliver. To do this we aimed to provide an infrastructure and culture that inspired and supported our faculty and students' research aspirations and it was clear that to achieve this, growing research capacity was key and the efforts put in place to do this needed to range across multiple levels of the institution. Our 2018-21 institutional strategic review centres around two main strategic projects that were seen as drivers of the development of research staff and capacity. Firstly, a commitment from the institution to submit to the Research Excellence Framework for the first time. Secondly, focusing on supporting and upskilling individuals to become research active, provision of opportunities to collaborate with external institutions, creation of career progression pathways linked to research activity, and increased institutional funding to support research activity. To support research activity, in 2018 the institution created three additional research groups to add to the existing Centre of

[Biomechanics](#), to highlight, support and encourage the current research activity. The institution also developed research pathways for academic staff, and integration of research activity into the institutional workload model. Additionally, the [open access institutional repository](#) was developed to house research productivity, increasing the visibility and impact of research activity, enhancing the profile of research active staff.

1.2 Structure

1.2.1 Submitted staff

In the REF reporting period 2013 to 2020, between 2013 and 2016 the institution lacked University College status and was effectively a monotechnic delivering training to a single health profession. As such, the majority of staff are focused on teaching, with scholarship to support the development of teaching. The nine staff included in the Unit of Assessment have a variety of teaching, research, management, and clinical roles within the institution. For example, **MELLOR** works as a superintendent radiographer and **BREEN Ax** is responsible for quantitative fluoroscopy and radiation protection. Of the submitted staff, seven staff teach on pre-registration courses and four staff teach on postgraduate courses. Staff also have leadership roles for the delivery of teaching including **BELCHAMBER** as course lead for the MSc Physiotherapy and **HOLMES** as Postgraduate Framework Lead for the School of Chiropractic. Staff also have responsibilities within our Senior Management Team with **NEWELL** as Director of Research and **OSBORNE** as Director of Clinic. The Unit of Assessment also includes two full Professors (**BREEN A**, **NEWELL**)

1.2.2 Research centres

We currently have a small group of 11 Category A submittable staff (9.9 full-time equivalent) active research academic staff within the institution. Only 9 individuals are included here as 2 staff constituted a small additional Unit of Assessment which was excepted by REF from our submission. The individuals included here are associated with research activity that is formally constituted as four broad [research centres](#), which consist of: [Clinical and Applied Service Provision Research](#), [Health, Exercise, and Sports Science Research](#), [Biomechanics Research](#), and [Health Professions Education Research](#). Each centre is a focus of defined research activity, with aspirations to foster and encourage staff, disseminate research findings, contribute towards knowledge exchange and the research environment, and assist in generating income. Each of these research centres has a [convenor](#) who is a contact for internal and external engagement with the centre who also provide a route for research productivity to be collated and to work with the Director of Research (**NEWELL**) for planning and strategy purposes. **BREEN Ax**, **HOLMES** and **TAYLOR**, have roles as convenors of the [Centre for Biomechanics Research](#), [Centre for Clinical and Applied Service Provision Research](#), and [Centre for Health, Exercise, and Sports Science Research](#), and respectively.

The two research centres which make up this Unit of Assessment are the [Centre for Clinical and Applied Service Provision Research](#) and [Centre for Biomechanics Research](#). The [Centre for Clinical and Applied Service Provision Research](#) focuses on research to improve patient outcomes and delivery of health services. Research themes within this centre include: 1) developing and using patient-reported outcome measures within routine clinical practice, 2) understanding patient experience of illness, health services, and self-management, and 3) developing and evaluating health service delivery in specialist areas including paediatrics, pain management, and rehabilitation. The [Centre for Biomechanics Research](#) has expertise in medical physics and clinical biomechanics. Research themes within this centre include: 1) developing tools for the measurement and interpretation of dynamics and stresses in the musculoskeletal system, 2) conducting research into biomechanical measures for the diagnosis of musculoskeletal pain and disability, and 3) generating subject specific measures of inter joint biomechanics through quantitative imaging biomarkers.

1.2.3 Research Governance

Research activity, governance and support are the responsibility of the institutions Research and Innovation Committee which meets 3 times per annum and reports to the institutional Academic Board. The Research and Innovation Committee is chaired by the institutional Director of

Research (**NEWELL**), who reports to the Deputy Vice Chancellor. The Research Innovation Committee comprises a substantive proportion of the submitted staff in this UoA including convenors of three of the four research centres (**HOLMES, TAYLOR, and BREEN AX**), University College Professoriate (Including **BREEN A** and **NEWELL**), Head of Library and Learning Services, Executive Director of Finance, Director of Clinic (**OSBORNE**), and two student representatives. Together, this interdisciplinary team makes recommendations regarding research activity, productivity and governance, have oversight of research integrity, delegate authority of research ethics activity and oversee planning and delivery of researcher development training.

The Research and Innovation Committee is responsible for the development and implementation of the [Research Ethics Policy and Procedures](#), formally reports proceedings of the institutional research ethics subcommittee, and has oversight of all ethical approvals from staff, postgraduate taught students, and postgraduate research students. The Research and Innovation Committee is also responsible for the annual [Research Integrity Statements](#) reported annually to the University College [Board of Governors](#) as part of the University Colleges commitment to a research culture centred on integrity and ethics as articulated by the [Concordat to Support Research Integrity](#). In line with the principles of the concordant, the University College has a [Research Misconduct Policy and Procedure](#), as a transparent and timely framework for dealing with any allegations of research misconduct by AECC University College staff and postgraduate research students. The Research and Innovation committee has responsibility for the oversight of the [Open Access Policy](#). The University College is committed to an open research environment, making research freely accessible to all, improving dissemination and facilitating engagement with research. The University College has an [open access institutional repository](#) for staff to deposit their final peer-reviewed journal articles and also supports Gold Open Access (where the output is openly available on the publisher's website) where appropriate funding is available to meet the costs of open access article processing charges. Although AECC University College has limited funding to support Gold Open Access, staff are encouraged to include article processing charges in their funding applications, even if it is not a prerequisite of the funder, to allow for publishing in open access journals.

1.3 Research and impact strategy

The AECC University College institutional strategy is currently being revised for the next five-year period. This will include the institution's operational plan for research, centred around a core institutional theme of *Discovering and Sharing knowledge* which is part of a vision to deliver research in health and related fields of expertise of national and international importance. This strategy sets out the major considerations oriented toward achieving key goals that will underpin an institutional conversation regarding vision, goals, plans and resource implications for the consolidation, expansion and embedding of a generation of high-quality research within the institution. It is intended to act as a focus to ensure that research contributes centrally to AECC University College vision, voice, objectives, and institutional school plans. We intend to be an institution that works toward building a recognisable reputation for health focused high-quality research of national and international standing. This research would broadly focus on addressing existing and emerging health challenges in our community and society at large, inform student learning within the health sciences, and would seek to contribute to supporting better health for all. We envisage a number of key strategies to underpin this aspiration:

- To support and develop existing staff to succeed and progress with research activity (currently ongoing, through an overview of workload modelling, and development of new academic framework),
- To develop further capacity of research active staff, through recruiting and retaining individuals with high research expertise and skills, and provide advanced training for staff on research methods, research skills, and research development.
- To develop and validate an AECC University College PhD program in partnership with another University (currently ongoing in discussion with a local University), working towards Research Degree Awarding Powers.
- To construct and validate an AECC University College Masters of Research (MRes) framework in line with the three academic Schools.

- To continue to conduct and publish high quality research in our areas of expertise, supporting research active staff in obtaining external research funding, and generate research that has national and international impact.
- To support the implementation of research into practice by committing to open access publishing, disseminating research at external events, and communicating to our collaborative networks via our website, newsletters, events.
- To develop our collaborative networks by improving our working partnerships and collaboration with external partners and networks (both locally, nationally, and internationally).

2. People

2.1 Staff

2.1.1 Staffing strategy

In line with the Research Strategy, the institution has focused on two strategies for staffing research activity. The first is to provide support for applications of research active individuals and the second is to support current staff with their research activity. As noted previously, until 2016 the institution focused on education of a single health profession with predominance of staff recruitment being focused on teaching. However, since gaining our University College title, we are progressing toward more explicitly supporting research activity as part of our recruitment expectations. During the assessment period, three new lecturers with significant research experience associated with this Unit of Assessment were recruited: **HOLMES, MELLOR, DU ROSE** and **BELCHAMBER**. To support current staff with their research activity, in 2018, two broad categories of research responsibility were added to the AECC University College workload model: *Research Responsibility (RR)* and *Developing Research Responsibility (DRR)*. The workload model identifies activities normally undertaken by academic staff and agrees a time allocation to each activity. These two categories were designed to formalise a recognition and investment in individuals' research, based on prior achievements, through apportioning defined research time in the institutions' workload model. Academic staff who wish to apply for categorisation do so in their annual appraisal documentation, which is then discussed with their line manager in their annual appraisal. The *Research Responsibility* pathway is for academic staff engaged in independent research activity, including the planning, delivery and dissemination of research. The *Developing Research Responsibility* pathway supports staff who are at a more nascent stage of their research activity and wish to engage more formally. This pathway specifically supports an ongoing strategy to build research capacity. Further, in 2018, **NEWELL** was promoted to Professor of Integrated Musculoskeletal Care

2.1.2 Commitment to equality and diversity

AECC University College is fully committed to having a diverse and inclusive culture which offers equality and opportunity for all as laid out in the institution's [Equality, Diversity and Inclusion Policy](#). The Chair of all interview panels must have completed the University College's *Recruitment and Selection* training and *Unconscious Bias Training*. We encourage effective annual appraisal to ensure that staff are supported, and opportunities for mentorship, training and promotion are identified. In 2019-2020 100% of University College academic staff had an appraisal. All line managers involved in appraisals receive training in the principles of equal opportunity in employment, acknowledging the effect that circumstances can have on individual researcher productivity, and ensuring that individuals do not receive less favourable treatment on the grounds of age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, or sex and sexual orientation. As of the HESA return 2020, there were 53 academic staff, with 53% male, 94% white, mean age = 47 (28-76). The submitted staff are reflective of the wider pool of category A eligible staff, with 56% male, 88% white, mean age = 50 (30-76). The Senior Management Group is responsible for annually reviewing staff employment data on recruitment, pay, and training to monitor equality and diversity within staff.

2.1.3 Staff development

Many of the institution's category A eligible staff are practising professionals in their specialism (for example: chiropractors, physiotherapists, radiographers), providing an insight into current clinical practice and shaping their field of health science. As part of the work of the convenors

and advised by the Research and Innovation Committee, **BREEN Ax**, has worked on creating a long-term plan for continual development and upskilling of staff in terms of research skills. As part of this, the committee are offering free internal and external driven workshops, webinars, resources, and mentorships. In discussion with their line manager, staff also have the opportunity to apply to attend continuing professional development courses to improve their skills in areas identified in their appraisal, in line with the strategy of the School and the institution. In the past, submitted staff have attended courses such as: Research Design Service Grant Writing Workshop, NCRM Research Methods Festival, and attendance at conferences for staff development. Further, AECC University College allows for staff to apply for support to complete award-bearing courses.

As an institution, AECC University College has engagement with several external bodies to support the professional development of our research active staff. In December 2020, AECC University College joined [Vitae](#), a non-profit programme supporting the professional development of researchers, to access support and best practice for research active staff. Through Vitae, staff have access to support and training as part of the [Vitae website](#). The University College is in the process of signing the [Concordat to Support the Career Development of Researchers](#), which commits the University to the principals that underpin early researcher development particularly early career researchers. As part of this commitment the University College intends to apply for the [HR Excellence in Research Award](#) run by Vitae which will require an institutional gap analysis against the principals of the concordat and an action plan to address gaps. The University College is also a member of [GuildHE Research](#), the research consortium for smaller and specialist higher education institutions. This organisation is a collegiate peer-to-peer network of 30 comparable institutions that supports its members to embed a positive research culture, develop robust research and innovation strategies, and establish appropriate infrastructure through which they can drive forward their ambitions. It provides researchers of all stages with opportunities to network and collaborate with peers across the UK and from a broad range of disciplines, facilitating activities face-to-face and virtually, including an annual doctoral summer school, training events, and opportunities to forge new projects and communicate their research. Staff are encouraged to attend meetings held by GuildHE, and **NEWELL** and **HOLMES** have attended regular meetings since inception of membership in 2018.

2.2 Students

AECC University College are engaged in the process of seeking validation of a Post Graduate Research program as the first step toward Research Degree Awarding Powers through partnership with an existing Higher Education Institution who already hold Research Degree Awarding Powers. We are presently in negotiations with a local University (initiated in 2018) and aim to have validated a postgraduate research program by 2021/22 with the opportunity to start to build a post graduate research school. The University College is committed to research supervision, collaborating with other institutions to supervise postgraduate research students. Three submitted staff are currently supervising six postgraduate research students who are based at other institutions. **NEWELL** is supervising four students, two of whom are exploring the role of contextual factors in therapeutic encounters, one based at Bournemouth University and another at the University of Southampton. A further student at Southampton University is exploring the role of acupuncturists in supporting behavioural change of patients in relation to healthy living choices and one student is based at Teesside University, developing a postural measurement smartphone app. **BREEN Ax** is supervising a student exploring the biomechanical effects of spinal manipulation at Bournemouth University and **DU ROSE** is supervising a PhD student exploring the relationships between cognitive decline and spinal pain at the University of South Wales. Furthermore, since 2013, five submitted staff (**NEWELL**, **BREEN A**, **BREEN Ax**, **OSBORNE**, **TAYLOR**) have supervised ten students to completion at multiple UK HEIs including University of Portsmouth, Bournemouth University, University of Southampton and King's College London. Additionally, staff act as expert advisors to external PhD projects and as external examiners for PhDs. For example, in 2020, **BREEN Ax** was involved in a collaborative research project and application for a travel grant from the Canadian Society of Biomechanics, for a PhD student from Memorial University Newfoundland to travel to AECC University College to collect and analyse data using quantitative fluoroscopy and motion capture. In addition,

NEWELL and **BREEN A** have also externally examined a total of 12 PhDs with 7 of these internationally.

3. Income, infrastructure and facilities

3.1 Income

Historically, being both a small specialised institution and one with a necessary focus on a single profession constituting its major undergraduate and post graduate activity, the reported research income reflects the size of the institution, the historical focus on vocational healthcare training, and the narrow scope of profession-based funding sources. However, recent changes have seen both an increase in scope and diversity of recruited research active staff and changes to develop research staff through defined internal research pathways as articulated elsewhere. We are as an institution at the beginning of a journey to expand and diversify our research expertise and culture and consequently we have demonstrated a modest income for research during the REF census period. However, AECC University College were only recently required to submit HESA returns in November 2018 covering the period 1st August 2017 – 31st July 2018, so a proportion of research income was generated prior to this date but still within REF2020 time frame. However, our forward-looking strategy is to build expertise in successful research funding as part of a refocused research culture and such outcomes will increasingly become embedded in broad expectations within the institution and are already explicit within the institutions new research pathways as articulated elsewhere.

Notwithstanding, given the present absence of post graduate research training, the funding during the REF period was often highly collaborative around matched funded PhDs. Here, the AECC University College or other external funding bodies supported a proportion of the funding together with key Unit of Assessment staff providing supervision for PhDs registered at other HEIs. These included University of Southampton, **NEWELL** (2014) PhD Studentship £45,350; Teesside University, **NEWELL** (2015). PhD Studentship: £45,000; Bournemouth University, **NEWELL** (2017): PhD Studentship £48,000; Bournemouth University, **BREEN A** (2012) PhD studentship £44,706; Bournemouth University, **BREEN A** (2014) PhD studentship £44,709; Bournemouth University, **BREEN A** (2018))

The two themes associated with the UoA around patient reported outcomes/service provision and imaging/biomechanics generated notable funding despite the small size of the institution. However, some of this funding despite being secured by academics at AECC University College funded projects within other HEIs as opposed to funds coming directly to the institution. This was reflective of the aforementioned collaborative culture pre our own University status, where aligning with other established HEIs, including embedding our own research initiatives within their environments, was a strategy to maximise our research impact pre our own emerging research capacity.

In PROMs and related clinical service provision research, a large grant (**NEWELL**; 2016; £360,000) funded a project within the Faculty of Medicine, University of Southampton and has to date supported a Senior Research Fellow, Research Fellow and PhD studentship registered at Southampton. This theme also underpinned the successful funding of a number of collaborative projects within aligned areas where funds were directly accrued to AECC University College including a collaboration with colleagues in the Netherlands, Australia, Canada and UK exploring clinical outcomes in seniors attending for chiropractic care (**NEWELL**; 2018; £13,484), the development of a UK based practice-based research network (**HOLMES** and **NEWELL**; 2020; £24,735) and patient satisfaction and experience study in collaboration with the General Chiropractic Council (professional regulator) (**NEWELL** and **HOLMES**; 2020; £29,852)

The UoA theme in imaging and biomechanics also generated funding including estimation of in vivo inter-vertebral stresses during bending motion (**BREEN A**; 2015; £40,344) and a collaborative project with the European Space Agency testing the Mk VI microgravity counter measure 'Skinsuit' (**BREEN A**; 2018/2019; £51,716)

Outside of these themes UoA members have also generated income during the relevant time frame with **MELLOR** in 2020 awarded £9,847.03 from the Radiographers Industry Partnership Scheme (CoRIPS) for a program of work (*STOPPAGE: STandardisation Of suPine Pelvic rAdioGraph tEchnique*)

3.2 Research support

Going forward our strategies for increased success in successful research funding bids will be informed by our first REF exercise and a focus on a broader research funding body targeting as well as building process and policy absent our pre-University status. We have embarked on a process of understanding and curating financial expertise around research costings and have created an internal grant governance/monitoring process as well as initiating membership accounts on Joint Electronic Submission for UKRI funding applications (one grant in progress). We will instantiate a proactive stance to awareness of the collection of impact data going forward for the next REF cycle by providing internal workshops. The Director of Research has a budget which has provided seed funding/pump priming of small collaborative projects and funding for attendance at conferences to present research findings, if not supported by a research grant.

3.3 Clinical facilities for specialist research

The University College has been providing clinical services on site for many years and in 2008 completed a purpose built 24 treatment room clinics on campus that provides care for over 50,000 patient visits per year. This provides a rich clinical environment where we have been working to embed routine PROM collection in this clinic using Care Response, a web-based platform for collection and aggregating patient outcomes over the course of care. Recently (2020) we have been successful in a [LEP bid \(£2.7 million\)](#) to build a bespoke rehabilitation centre which aims to provide care for a wide range of patients (Cardiovascular, Stroke, Respiratory, Sport and Musculoskeletal). This facility will form part of the forward-looking research strategy around curating routine PROM collection and embedded clinical research in clinical facilities at AECC University College as a natural complement to both educational and clinical provision activity and underpinning our 3 mission aims.

The University College also has a vibrant Ultra Sound department within the School of Radiology which provides care to around 6000 patients a year. In 2015 we invested £1.3M in an open, [upright MRI scanner](#), which is used in research and also operates as a specialist NHS referral service that is widely accessed throughout the South of England as Bournemouth Open Upright MRI seeing around 1500 patients a year. This facility underpinned the funded research in collaboration with the European Space Agency evaluating the effects of a microgravity countermeasure skinsuit on the intervertebral disc. It has also been used in studies to determine the effects of intervertebral disc degeneration on the segmental stability of the spine in living subjects. Both studies were also supported by the Radiological Research Trust.

4. Collaboration and contribution to the research base, economy and society

4.1 Research collaborations

4.1.1 National collaborations

Submitted staff are involved in a significant number of national research collaborations across multiple HEIs and a range of projects.

A recent project involving the AECC Universitas expertise in standing MRI imaging, the European Space Agency and Kings College London has explored an innovative skin suit designed to prevent spinal disc shrinkage in astronauts (**BREEN A** and **BREEN Ax**). This was funded for 2 consecutive years. Quantitative fluoroscopy expertise developed here at the University College has also generated multiple collaborative projects around spinal motion and musculoskeletal control of movement in normal and spinal pain subjects. These include ongoing collaboration with **Bournemouth University** exploring the role of spinal manipulative therapy on changes in cervical motion segment interactions in patients with neck pain and Cardiff University looking at trunk muscle activation and thoraco-lumbar kinematics in non-specific chronic low back pain

(**BREEN A, BREEN Ax and Du ROSE**) and a collaboration with Exeter University on estimation of in vivo inter-vertebral stress during motion using fluoroscopic and magnetic resonance imaging informed finite element models (**BREEN A and BREEN Ax**).

Further significant collaborations include a 5-year funded program of work investigating models of delivery of manual based care for musculoskeletal pain within or aligned to the NHS in the University of Southampton, Faculty of Medicine (**NEWELL**). Other work in collaboration with Southampton included an ESRC South Coast Doctoral Training Funding award for a combined MSc/PhD exploring contextual factors as predictors of outcomes in patients with low back pain undergoing chiropractic treatment (**NEWELL**), a doctoral studentship exploring the role of behavioural change amongst acupuncture practitioners (**NEWELL**) and the experience of back pain treatments, treatment decisions, and return to work (**HOLMES**).

Additional collaborations included **Keele University** exploring the validity, reliability and responsiveness of the NHS recommended MSK HQ PROM in a chiropractic patient population (**NEWELL**), University of Teesside with the development of an app to measure posture (**NEWELL**), Solent University and Bournemouth University exploring strength training in Low Back Pain (**OSBORNE**) and pain perception and brain plasticity in chronic low back pain patients (**NEWELL and OSBORNE**). We also have collaborations with Bournemouth University looking at the effect of physical activity on menopausal symptoms (**TAYLOR**) and University of South Wales (**DUROSE**) exploring the relationships between cognitive decline and spinal pain.

Staff also have significant collaborations within the chiropractic profession. For example, **NEWELL** and **HOLMES** regularly work with clinical and other academic colleagues within both the chiropractic and osteopathic professions. **NEWELL** and **DUROSE** also have links with other UK HEIs delivering chiropractic programs, such as the Welsh Institute of Chiropractic at the University of South Wales, London South Bank and Teesside University. Staff also have collaborations with research groups in other healthcare disciplines. **BREEN A** and **BREEN Ax** have previously collaborated with the University College of Osteopathy, working on principal component analysis of intervertebral motion and **NEWELL** is a member of a clinical trial steering group for the Crying Unsettled and distressed Infants Effectiveness Study of osteopathic care. **OSBORNE** is also involved in NHS assessment, diagnosis, and self-care of patients with joint pain and evaluation of a [First Contact Practitioner](#) role in 5 local GP surgeries. **OSBORNE** is also a member of the **NHS Spinal Pathway Task and Finish Group**. Recent developments such as successful LEP bid to build an Integrated Rehabilitation Centre at the AECC University College and the provision of NHS Long Covid services at the institution are also facilitating the building closer research links with CRN Wessex, local NHS Hospital Trusts and local councils' part of a strategy to grow and improve provision of research capacity by the AECC University College in collaboration with the NHS, local councils and community projects.

4.1.2 International collaborations

Members of the UoA have a range of ongoing international collaborations including **TAYLOR** who works with Ben Gurion University of the Negev, Israel on postnatal depression, pre-term birth and mother-infant bonding, **BREEN A** and **BREEN Ax** who collaborate with Aalborg University in estimating intervertebral motor control in the cervical spine, Canadian Memorial Chiropractic College exploring observer analytic repeatability of intervertebral motion biomarkers the Memorial University of Newfoundland comparing surface and quantitative fluoroscopic measurement of lumbar function and Michigan State University developing a new model of back pain. **HOLMES** works with Parker University, Palmer College and Canadian Memorial College in the US and Canada on patient safety projects and **HOLMES and BREEN Ax** were also fellows of the Chiropractic Academy for Research Leadership (from 2017 to 2020), through a competitive international fellowship. **NEWELL** also works with Monash University exploring consumer understanding of terms used in imaging reports requested for low back pain and Vrije University Amsterdam, Netherlands, Macquarie University, Sydney, and Karolinska Institute, Sweden running a multi country large prospective study of outcomes in seniors with chronic low back pain undergoing conservative care.

4.1.3 Role within supporting wider research and development

Submitted staff also are key contributors in supporting the wider research environment, with a number of staff having roles on editorial boards of journals, and reviewing manuscripts for a range of inter-disciplinary health sciences journals. Submitted staff make significant contributions within the field of manual therapy, sitting on the editorial boards of a number of journals including: **BREEN A** and **NEWELL** for [Chiropractic and Manual Therapies](#), **BREEN A** for [Journal of Manipulative and Physiological Therapeutics](#), **OSBORNE** for [Journal of Bodywork and Movement Therapy](#) and **NEWELL** for [The Journal of Chiropractic Education](#). Submitted staff also peer review for these journals and others in this discipline including: Hong Kong Physiotherapy Journal, Musculoskeletal Science and Practice. In addition, submitted staff also support a wide range of journals within the healthcare field. **TAYLOR** sits on the editorial board for [Healthcare](#) and is the co-editor in chief for [Complementary Therapies in Clinical Practice](#), **BREEN Ax** is on the editorial board for [BMC Musculoskeletal Disorders](#). Submitted staff also review for journals within the context of 1) musculoskeletal pain and healthcare: European Spine Journal, Journal of Pain Research, The Spine Journal, 2) biomechanics: Clinical Biomechanics, Computer Methods in Biomechanics and Biomedical Engineering, Medical Engineering & Physics, and 3) clinical practice: BMJ Open, Health and Quality of Life Outcomes, Journal of Clinical Medicine, and Supportive Care in Cancer.

Staff have also been invited to deliver workshops on developing research. Using her experience and perspective as an editor of an international journal, **TAYLOR** collaborated with other editors to deliver a workshop on publishing at the [European Congress of Integrative Medicine](#) (2019). **BREEN Ax** and **HOLMES** also delivered invited workshops on early career researcher capacity building at the [World Federation of Chiropractic](#) Congress (2019) and mentoring within chiropractic institutions at the World Federation of Chiropractic Education Conference (2018).

4.2 Contribution to clinical practice

4.2.1 Contribution to measurement of patient outcomes

BOLTON, **NEWELL** and **HOLMES** have had a substantive contribution in the development, cultural knowledge exchange and use of PROMs in manual professions through the development and validation of one of the first biopsychosocial outcomes for musculoskeletal pain conditions. The Bournemouth Questionnaire (BQ) has been translated into 10 languages and is recommended by multiple organisations, including professional bodies, clinical guidelines and legislative guidelines in multiple countries. In addition, AECC University College in collaboration with an external clinical academic have been central in the development a web-based PROM dissemination site that distributes PROMs to patients automatically over a treatment period and collects, collates and analysis clinical outcome data to support patient centred care. Presently this platform is used by over 3000 practicing clinicians in 14 separate countries. Anonymised data from this system has also been used to conduct multiple research studies exploring a range of clinical questions using large cohorts of patients and a range of different outcomes including the STarT Back and the BQ. Dissemination of these PROMs and knowledge concerning adoption has been particularly impactful in the osteopathic and chiropractic professions where multiple presentations have been conducted and awards achieved. For example, **NEWELL** has been awarded prizes for work concerning PROMs by the British Pain Society, The European Academy of Chiropractic (2014), European Chiropractic Union and the World Federation of Chiropractic and **HOLMES** was awarded a poster prize at CAMSTRAND conference

Members of this group have also disseminated PROMs and other areas of expertise through multiple invited presentations. For example, **NEWELL** has been regularly invited to talk about the use of PROMs in clinical practice at the British Chiropractic Association (2013), World Federation of Chiropractic Education Conference (2014), Academy of Physical Medicine (2019) and the Chiropractic Australia Conference (2019). **HOLMES** was also invited in 2018 and 19 to present to the Royal College of Chiropractors concerning the use of PROMs in the treatment of back pain and by chiropractors during chiropractic care.

4.2.2 Contribution to general clinical practice

NEWELL has also been a champion of the need to adopt a stronger evidenced based care approach within the chiropractic profession and has been asked to talk on this theme at the British Chiropractic Association (2017), the Norwegian Chiropractic Association (2017) the Swedish Chiropractic Association (2018), Murdoch University, Perth (2019), Macquarie University, Sydney (2019) and the University of Central Queensland, Gold Coast (2019). **NEWELL** has also been invited extensively to present on the influence of contextual factors in manual therapy for the Norwegian Chiropractic Association (2017), the World Federation of Chiropractic (2018), the Royal College of Chiropractors (2018) the National Conference of Osteopathic Research (2019), Chiropractic Australia Annual Conference (2019) and L'institut Franco-European De Chiropraxie (2020).

4.2.3 Contribution to biomechanical imaging

As noted in our impact case study (dynamic biomechanical imaging assessment of spinal joints), research conducted at AECC University College has contributed to the development, validation, dissemination, engagement activity and commercialisation of quantitative fluoroscopy, a technology based on fluoroscopy and image processing, for performing biomechanical examinations of the spine for the clinical assessment of treatment resistant spinal pain. From 2014 to 2020, **BREEN A**, **BREEN Ax**, **MELLOR**, **DUROSE** conducted a number studies on biomechanical imaging, including: uneven motion sharing as an objective biomarker for nonspecific low back pain, biomarkers in upright active motion, normative values in biomarkers, and electromyography during motion. These outputs have been highly accessed, leading to considerable debate in the back pain research community worldwide.

In 2015, the AECC University College hosted a special conference of the [Society for Back Pain Research](#) devoted to Biological Factors in Back Pain. This theme was soon taken up by other international societies, namely the International Forum on Back and Neck Pain (2015), the North American Spine Society's (NASS) International Workshop on Spine Control (2015), the 9th World Conference on Low Back and Pelvic Pain (2016), a second International Back and Neck Pain Research Forum (2017) a further NASS-sponsored Invited Workshop on Cognitive mapping of a conceptual models of back pain (2017), a further SBPR Conference on the Mechanisms in Back Pain in 2018 and the 10th Interdisciplinary World Congress on Low Back and Pelvic Girdle Pain in 2019. Research conducted by submitted staff was disseminated at all of these international conferences. This biomechanical imaging work has generated an abundance of knowledge dissemination activity over the time frame of this REF submission. For example, **BREEN A** has been invited to talk on a range of areas linked to this research including; Spine Science's State of the Art Forum (2013, 2015), Ramsay Health Care Spinal Symposium (2014), BCA Anniversary Conference (2015), Annual Conference of the Royal College of Chiropractors (2016), Special Seminar Arthritis Research UK (2016), World Conference on Low Back and Pelvic Pain (2016), North American Spine Society Conference (2017), Musculoskeletal Research Connect & Collaborate: Evidence Update: Southern Central Council for Allied Health Professional Research (2017), Conference of the Task and Finish Group of the NHS Dorset Clinical Commissioning Group (2019), UK Imaging and Oncology Conference (2020). Recent research by **BREEN Ax** and **BREEN A** on disc degeneration affecting inter-vertebral motion in asymptomatic controls was awarded best scientific poster at BritSpine conference (2020). Progress with quantitative fluoroscopy research also coincided with the rise of international research interest in the mechanisms of spinal pain and the possibility of mechanism-based management of low back pain. It also gave rise to an acceleration of studies, collaborations and to a programme of work since 2014 that has included 6 joint funded and supervised PhD projects with Bournemouth University.

4.3 Contribution to education

4.3.1 Cultural Impact on Chiropractic Education

The AECC University College through its historic links over many years with the chiropractic profession through the training of chiropractors has had a major impact on the profession through the graduation of students, many of whom have gone on to significant leadership roles within the

profession and who increasingly see research as a potential career choice. In addition, in the last 5 years a debate concerning the evidence base for the profession and the need for a more evidence-based chiropractic education has led to several initiatives to guide the profession toward this paradigm constituting as it does a central expectation in healthcare. As part of this drive by key individuals within the profession, **NEWELL** has played a pivotal role in founding the [International Chiropractic Education Collaboration](#). This group of now 16 universities, institutions and chiropractic programs worldwide have committed through signatory to an *Education Position Statement* written by founders of the group that highlight key areas of evidence based clinical practice that the programs commit to actively enhancing within chiropractic training. This has had a significant impact on the global chiropractic educational community cultural conversation and political positioning and provides a bench marked public commitment to societal expectations around the delivery of care displayed on all signatory's institutional course web pages. (see [here](#) for AECC University College)

4.3.2 Research on the education of healthcare professionals

UoA members have also contributed to the educational research concerning health care professions as highlighted by recent publications including predictors of final degree success using end-of-year grades in a chiropractic master's program (**NEWELL**), the association of novel academic and non-academic factors with chiropractic student academic performance (**NEWELL**) and exploration of evidence-based competencies in chiropractic education (**HOLMES**). **DUROSE** was also invited to give a presentation concerning video observations as feedback in psychomotor skills training and a further presentation standardised curriculum for Jurisprudence, Ethics and Business at the World Federation of Chiropractic Association of Chiropractic Colleges.

4.3.3 Supporting students to consider research careers

A number of the submitted staff are involved in the teaching of research methods to pre-registration and postgraduate courses (**BREEN Ax, TAYLOR, NEWELL, HOLMES**). The development of interprofessional research methods teaching amongst sport rehabilitation and therapy students, sports and exercise rehabilitation students, and chiropractic students, developed and delivered by **TAYLOR** and **HOLMES**, was a commendation from the validation panel. The embedding of research skills into the curriculum and research opportunities for students (developed by **HOLMES**) was a commendation within the recent revalidation of the pre-registration chiropractic course.

Staff are also committed in supporting students to be involved in research and consider research careers. Six submitted staff are currently involved in supervising MSc students' dissertations from a range of disciplines, including but not limited to: chiropractic, physiotherapy, radiography, and occupational therapy. Students are actively encouraged and supported to publish their research findings and present work at conferences. Previous work has been published in a number areas of including: chiropractic identity, practitioners' perspectives on public health, and recruitment and retention of healthcare professionals. Staff supervise additional research opportunities for students and graduates, providing them with research experience. Three staff (**DUROSE, NEWELL** and **HOLMES**) were successful in receiving funding (£17,500 total) in 2018 and 2019 from the [Chiropractic Research Council](#) to support students on the [Programme for Early Researchers in Chiropractic \(PERC\)](#). PERC is set up to provide recently graduated health care students (chiropractors to date) to experience a research 'taster'. This constitutes an 8-week research project immediately post-graduation and was in collaboration with Arthritis Research UK, centre for sport, exercise and osteoarthritis and the University of Southampton. Four other HEIs (University of Leeds, Oxford University, University of Salford and the University of the West of England) were also part of the scheme. The students were funded for an 8-week project supervised by members of the UoA which constituted a stipend plus travel and subsistence to attend weekly conference days at the participating universities which involved other health care students. Each student was funded by the Chiropractic Research Council to a total of £3,500. To date 5 students have completed this program with 3 submissions for publication of their work with one published and One presently under review. This experience has led to interest from

candidates to pursue further research training and degrees which was one of the central aims of the scheme when first envisaged for the podiatry profession by [Bowen et al.](#)

4.3.4 Improving equal access and participation in higher education

The staff in the submitted unit are actively engaged in the institution's [Access and Participation Activity](#). AECC University College is committed to improve equal access and success in Higher Education for underrepresented groups, with a number of collaborations with our local community, and outreach and recruitment activities, set out in our [Access and Participation plan](#). Since 2019, submitted staff have developed and delivered a variety of activities to students from local schools and further education institutions. This includes our research active staff giving specialist talks within their clinical background (**OSBORNE**), area of expertise (**TAYLOR**), and research skills (**HOLMES**). **OSBORNE** and **HOLMES** have also been involved in two Summer Schools, allowing students within Further Education to experience lectures, labs, and practical sessions in their chosen subject. Students also have access to career videos, both highlighting clinical careers (**OSBORNE**) and research careers (**DUROSE**). **HOLMES** has also been involved in launching the Access2AECC programme, with year 12 pupils involved in planning, conducting, and presenting a mini research project. This project has led to further work within the institution on collaborating with local Further Education institutions to develop resources and support for students undertaking the [Extended Project Qualification](#).