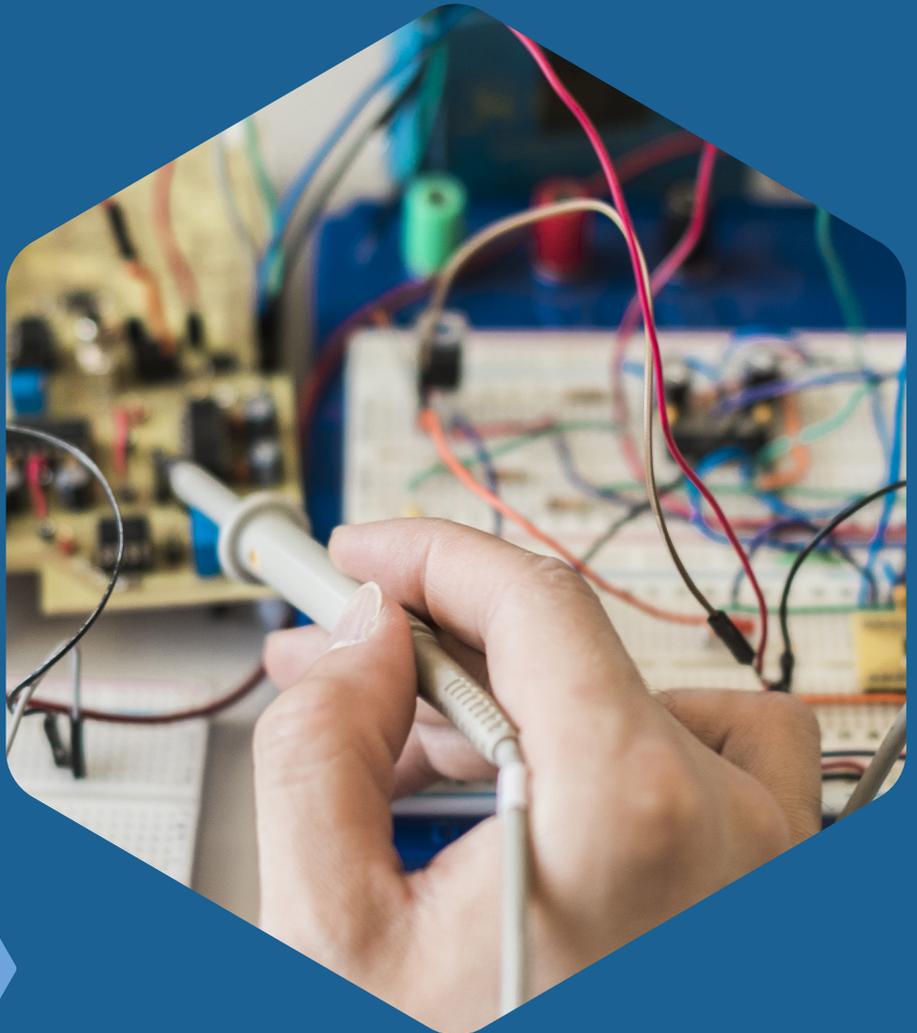




# UCL

## INSTITUTE OF HEALTHCARE ENGINEERING STRATEGY 2030







# OVERVIEW

The UCL Institute of Healthcare Engineering (IHE) stimulates and supports interdisciplinary, world-class research and innovation in healthcare engineering and digital health. We bring together leading researchers across UCL and our partner hospitals to develop the next generation of digital and medical technologies, transforming lives across the globe.

The IHE is a cross-Faculty UCL Institute, led from the Faculty of Engineering Sciences. We have excellent links with our clinical partners in primary and secondary care, for example through the UCL-affiliated Biomedical Research Centres at UCLH, Moorfields and Great Ormond Street Hospital. The diversity and volume of world-class research and innovation at the intersection of engineering and healthcare at UCL is staggering. Our unique position at the interdisciplinary centre of this allows us to build partnerships and collaborations across the university and beyond.

## TODAY THE IHE IS:

- A 4-strong Directorate with expertise spanning biomedical engineering, digital health, enterprise and innovation, clinical and biomedical sciences
- A further 6 members of a Management Team comprising research, enterprise and education expertise spanning the UCL Faculty of Engineering Sciences, and School of Life and Medical Sciences
- Around 50 active Delivery Group members, representing the interdisciplinary research, education and clinical community across UCL and our hospital partners, as well as UCL OVPs and UCL Professional Services
- An 8-strong Advisory Group comprising leaders of key groups, Centres and stakeholders
- A Professional Services team of 3, including Research and Development Communications & Impact Manager Marketing Officer, supplemented by Public Engagement Manager
- A community including over 1680 newsletter subscribers, 3274 Twitter followers, an average total of 2000 attendees across annual events each year



Acting as a shop-window to UCL's excellence in healthcare engineering and digital health, we engage external partners across clinical care, industry, policy, funding, charity, patient and public groups. By leveraging this network and by supporting and training our community, we help to embed an innovation pipeline through which advances in fundamental science and engineering underpin the next generation of healthcare technologies. Within the healthcare engineering remit, UCL:

- Ranks 1 in the UK in biomedical engineering and for Medical Technology and 2 in the UK for Computer Science & Engineering (Shanghai Rankings 2020)
- Performs at an internationally competitive level in research outputs, as judged by e.g. the REF 2014 (Computer Science top-rated in UK; 95% of Biomedical Engineering rated 4\*,3\*; Biochemical/ Chemical/ Electrical/ Mechanical Engineering 100% case studies rated 4\*,4\*), Web of Science citation metrics (ranked 2nd in UK for mean h-index, and number of citations in biomedical engineering, and the top 16 globally)
- Consistently performs at the highest level in attracting funding from UKRI and charities, both in terms of responding to strategic calls, and ongoing responsive mode bids (e.g. UCL holds the largest proportion of the EPSRC Healthcare Technologies portfolio at 13% / £37M in 2020)
- Provides the base for strategic funded initiatives including the Wellcome-EPSRC Centre for Interventional Surgical Sciences (WEISS: £13M); EPSRC Future Targeted Healthcare Manufacturing Hub (£10.3M); EPSRC Future Vaccine Manufacturing Research Hub (Vax-Hub) (£7M); EPSRC Hub for Collaborative Healthcare Innovation through Mathematics, Engineering and AI (£2.6M); EPSRC Medical Image Computing for Next-Generation Healthcare Technology (£1.5M)
- Supports or links to 4 EPSRC Centres for Doctoral Training (Intelligent, Integrated Imaging in Healthcare; Bioprocess Engineering Leadership; Transformative Pharmaceutical Technologies; AI-Enabled Healthcare)



- Is highly competitive nationally at attracting Fellowships at all career stages, e.g. 5 EPSRC Healthcare Technology Challenge Awards (19 awarded nationally), 3 Royal Academy of Engineering Chairs in Emerging Technology, 7 UKRI Future Leaders Fellows
- Interfaces with the health theme in the Alan Turing Institute through Health Data Research UK London (HDR-UK London)
- Interfaces with our hospital partners through explicit funded initiatives e.g. NIHR UCL-UCLH Biomedical Research Centre cross-cutting theme in Healthcare Engineering and Imaging (£4M)

As we move to the next ten years, our ambition is to build from this base to develop the people and technologies needed to improve people's lives globally through innovation in healthcare engineering education and research. We will achieve this through interdisciplinary collaboration, alongside an ecosystem of partnerships with the public, patients, healthcare professionals, policy makers and industry that enable societal impact on a global scale. To achieve this, we will remain aligned with the UCL Faculty of Engineering Sciences (FES), School of Life and Medical Sciences (SLMS) and wider UCL strategy, as well as those of our hospital partners. We will continue to work closely with the offices of the VPs and our business partners in Professional Services, maximising our capacity to deliver in an integrated fashion and at scale, with a balance of both leading new initiatives and, where appropriate, acting as a pilot to support broader endeavours.



# VISION

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**OUR VISION IS TO BE AN INTERNATIONALLY-LEADING FACILITATOR AND CENTRE FOR INTERDISCIPLINARY RESEARCH, INNOVATION, EDUCATION AND KNOWLEDGE EXCHANGE IN HEALTHCARE ENGINEERING**



**1** Professor Rebecca Shipley (right) speaks with Rt Hon Chris Skidmore, former Minister of State at the Department for Education and the Department for Business, Energy and Industrial Strategy.

**2** A child enjoys an interactive activity at Science of Surgery 2019, an IHE-supported event for children and their families exploring the future of surgery.



# STRATEGIC OBJECTIVES

## 1 CAREERS

To embed a culture where early-career researchers are nurtured and supported, alongside common training and mentoring frameworks, to enable our researchers to pursue diverse careers as the multidisciplinary healthcare engineers (and complementary clinicians) of the future.

## 2 EDUCATION

To be at the forefront of developing and delivering educational programmes that equip graduates to tackle global challenges through healthcare engineering. This will necessitate working collaboratively across our interdisciplinary base, and with clinical and industry partners.

## 3 ENGAGEMENT

To embed engagement and co-creation in the IHE ethos, as well as influencing national policy. This will span engagement with end-users of the technologies we develop (patients, carers, healthcare professionals, etc), through to publics and policy makers.

## 4 GLOBAL

To maintain a truly global outlook through the development of international partnerships in healthcare engineering research, innovation, education and knowledge exchange, as well as defining the role of healthcare technologies in meeting sustainable development goals.

## 5 RESEARCH OPPORTUNITIES

To stimulate and support impactful research in healthcare engineering that is internationally recognised, by taking full advantage of our multidisciplinary base, critical mass, and internal and external partnerships.

## 6 TRANSLATION AND INDUSTRY

To develop the partnerships and know-how required to translate healthcare engineering research into technologies that impact people's lives, and to identify promising engineering technologies for future widespread adoption.

## 7 ENABLERS

To work closely with colleagues across the UCL offices of the VPs, UCL Professional Services, and hospital partnerships to develop the infrastructure and estate to enable us to deliver SO1-6.

## 8 COMMUNICATION AND DISSEMINATION

To raise the profile of the IHE amongst key academic, clinical, industrial, funder and government audiences, acting as a shop window for all healthcare engineering activity at UCL and building the IHE brand. As well as to disseminate necessary information to our internal and external communities in an effective and timely manner.



# PRIORITY AREAS

We have defined four priority areas to reflect significant healthcare challenges that societies across the world will face for the foreseeable future. These are areas which necessitate interdisciplinary collaboration spanning engineering and health (and beyond), and which we are uniquely positioned to tackle by bringing together the breadth of relevant excellence across UCL, and by educating and training future generations of healthcare engineers. We aim to coalesce and grow capacity, establishing UCL's position as a centre for excellence in these areas over a medium-term timescale, working across each of our strategic objectives 1-7. We believe that each one identifies an opportunity for UCL's healthcare engineering community to be world-leading and to develop digital and medical technologies that transform lives across the globe. By being cross-cutting, these priority areas allow us to respond in a timely way to pressing needs (such as the 2020 pandemic) as well as longer-term strategic objectives.

## SELF, SHARED, PRIMARY AND COMMUNITY CARE

Achieving healthcare's 'triple aim' of improved health outcomes, improved patient experience, and reduced costs requires patients to be as engaged as possible in their health and health care, and for services to be integrated, providing seamless care close to the patient's home. Achieving this has proven extremely challenging. This theme will explore how to use new technologies, including data science, machine learning, sensors, wearables and other digital and medical technologies to enable people to adopt healthier lifestyles, actively engage with their health, take their rightful place as an equal member of a multidisciplinary healthcare team, and improve the quality and efficiency of service delivery across primary, community and social care.



## TIMELY DETECTION, DIAGNOSTICS AND INTERVENTION

Disease detection and diagnosis are at the heart of clinical decision making and patient monitoring. The development of improved tools to detect disease and to aid diagnosis is therefore a substantial component of healthcare engineering activity, with engineering-led examples including improved imaging technologies, sensor design, and machine learning applied to diverse and rich signals. Successful activity in this area will lead to detection and diagnostic developments that have clear value to patients and healthcare systems, in terms of accurate, affordable, and relevant diagnosis. The relevance of disease detection is heavily dependent on when it occurs; detection that is too late may mean treatment and prevention opportunities are lost, whereas detection that is too early may lead to wasted resources. Both scenarios may lead to unnecessary patient anxiety. We are therefore prioritising not only innovation in detection and diagnosis, but also those innovations that provide the right information at the right time to patients, carers and healthcare practitioners.

Timely diagnosis ultimately enables intervention at the right time. Engineering technologies underpin the development of most healthcare therapies and interventions, and we aim to pioneer advancements in this field. Focus will range from regenerative therapies and tissue engineering, to simulations that help clinicians prepare for surgical procedures or predict the efficacy of drug delivery, to the application of nano-engineering, robotics, medical imaging and augmented reality to enable surgeons to intervene with ever greater precision.

## HEALTHY AGEING AND MULTIMORBIDITY THROUGH THE LIFECOURSE

Healthy ageing is a national and international strategic priority. For example, the UK Industrial Strategy Grand Challenge mission (2019) aims to “Ensure that people can enjoy at least 5 extra healthy, independent years of life by 2035”. There are many opportunities for medical and digital health technologies that address this challenge across the life course, from healthy conception and growth through to older age where many people are managing multiple long-term conditions. Technologies range from apps that facilitate behaviour change for improved health through to advanced diagnostic and therapeutic technologies that support the delivery of highly individualised care. Future technologies are likely to exploit data on genetic, social and environmental determinants of health and support the integration of care across multimorbidities. They will support and coordinate the expertise of specialist and generalist health professionals as well as patients and carers, to address the complexity of health management, exploiting advances in medical device developments, data analytics, and user-centred design.

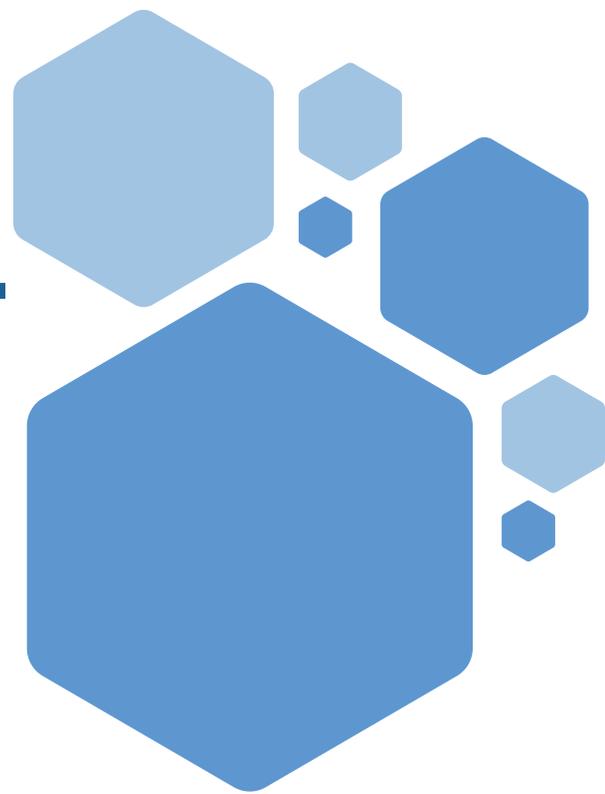
## EFFECTIVE AND COST-EFFECTIVE HEALTHCARE TECHNOLOGIES

The need for healthcare technologies that are safe, effective and cost-effective has never been more pertinent. Globally, the world faces an expanding and ageing population with an increasing set of complex needs and health issues and an increasing inequity of access to affordable healthcare. Safe, effective and cost-effective healthcare technologies can tackle this gap. From technology that turns portable mobile and wearable devices into accessible monitoring and diagnostic tools, to low-cost manufacturing processes for medicines, to using big data and AI to find more effective workflows, and to digital apps that encourage preventative lifestyle choices – there is significant opportunity for impact. A growing shift towards precision medicine should reduce the likelihood of inappropriate treatment and avoid associated costs. Reducing unnecessary workload and improving the efficiency and safety of clinical workflow will also impact patient experience and the mental health of healthcare professionals.



Close collaboration with international partners will offer us opportunities for bidirectional learning, will allow us to understand what the real challenges are in each region and what is needed to make technologies translatable and usable in low-resource settings. Crucially, the need for safe, effective and cost-effective healthcare technologies is also felt keenly in countries like the UK. As the NHS faces increasing resource constraints, this need has become particularly pressing. Incorporating a frugal mindset into our research offers the potential to save the NHS significant resources, which could then be directed toward patient care instead. As sustainability becomes increasingly important, we aim to develop technologies that have longevity and usability for many years.

# OPERATING ENVIRONMENT



Our interdisciplinary reach at UCL means that we are well positioned to harness the power of world-leading experts across multiple disciplines and bring these to bear on the global challenges facing society in the 21st century. However, this is not without its challenges. The operating environment around us is changing faster than ever with a shifting political landscape, increasing pressures on higher education and rapidly changing technological possibilities brought about by the “fourth industrial revolution” of digital connection, internet and unprecedented computing power.

The changing operating environment brings with it potential pressures and challenges including, but not limited to:

- the challenges presented by COVID19 including increased strain on healthcare systems, financial insecurity, pivot of focus to student recruitment, social distancing impact on events and remote working, and the ‘new normal’ that will affect us for years to come
- the uncertainty of Britain’s position globally post-Brexit and the potential changes in regulations, funding opportunities, collaborations and ability to attract European’s brightest students and researchers
- growing mistrust of experts in the political environment and growing ‘post-truth’ sentiments
- changes wrought by climate change and the pressing-need for further changes in our response to this threat
- growing necessity to embed changes in working practices to build resilience to unplanned external events, e.g. pandemics
- our ability to meet the Sustainable Development Goals and coordinate as part of a broader global response
- the rise of nationalism potentially combatting a global outlook
- the evolving relationship between universities and the private sector in delivering UK research objectives

- greater emphasis on the quality assurance of higher education, including greater external scrutiny through assessment (e.g. TEF, REF, KEF) and greater demand for return-of-investment from students (partly due to increased fee model)
- the growth in competition, both in the UK and overseas
- competition for resources and space within UCL, and ongoing financial pressure
- mental health pressures within universities including increasing work-loads and capacity amongst both academic and professional services staff

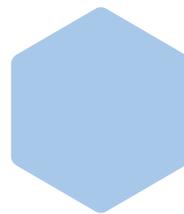
A changing environment also brings exciting opportunities and we must be prepared to be agile in response to these. An increasing importance is being placed on the role that technology and innovation play in driving global change, and we are well positioned to contribute to setting this agenda. Our goals and research priorities align with national and international areas of strategic importance and we must capitalise on this too. COVID19 also brings potential opportunities - such as accelerated innovation in areas like healthcare technologies for the home, renewed appreciation of the need for research and for prepared, well-funded healthcare systems, and creative opportunities arising from new technologies, virtual events and agile working. Finally, we welcome the growing societal emphasis on the importance of creating a diverse, inclusive and fair environment and we will strive to further this within our own community.



# DELIVERY ACTIVITY

Delivery of our first six strategic objectives is enabled through six delivery groups corresponding to the same six areas (Careers, Education, Engagement, Global, Research, Translation & Industry; referred to as DGC, DGE<sub>d</sub>, DGE, DGG, DGR, DGT&I, respectively), and supported by the IHE Professional Services Team (see 'Governance' diagram on page 14). The Delivery Groups (DGs) consist of academic, clinical and professional services members from a wide variety of disciplines and expertise, reflecting the IHE core ethos of interdisciplinary, collaborative partnerships.

Our long-term goal is to establish a strong and international profile in interdisciplinary research, innovation, education and knowledge exchange in healthcare engineering, delivering meaningful technological impact for unmet and/ or challenging healthcare needs at both the local and global scale. This will be achieved through delivery of our first six strategic objectives as detailed below, working to short (S: 1-3 years), medium (M: 4-7 years) and long-term (L: 8-10 years) timescales.



## CAREERS

We propose starting with a scoping survey to identify and attract ECRs to join the delivery group and to also identify online activities e.g. webinars, hackathon, mentoring, code club, that they would be interested in attending, leading or contributing to. The results of the survey and new ECRs will help shape the future plans, but our initial plan is to run a series of events throughout the academic year co-designed with ECRs.

Although the exact content will be designed in collaboration with ECRs, a range of training and networking opportunities are likely to be provided, with a clear focus on the fostering of connections between ECRs and senior academics from different UCL faculties and departments.

Our long-term vision for a self-sustained, engaged, interdisciplinary careers network feeds into our ideas for a long-term careers strategy to move towards a training scheme with an accreditation/qualification at the end, a 'discipline hopping' scheme where researchers/clinical fellows are able to shadow engineers/clinicians for a period of time and a dedicated, interdisciplinary Doctoral Training Programme.





## EDUCATION

The strategic objective for our Education Delivery Group is of primary importance, guiding, supporting and helping to develop the new generations of professionals and leading figures in healthcare and engineering and digital health (HE&DH) across the different sectors e.g. start-ups, larger industry, research, NHS. We are implementing a comprehensive strategy to achieve this goal.

Our short-term objective (1-3 years) is to review the current educational provision within UCL related to HE&DH and see how this compares with the extensive research experience and knowledge that we have, and the knowledge and skills valued and needed in workplaces across healthcare engineering related sectors.

Our medium-term objective (4-7 years) is to build up on our teaching, enterprise & translation, and subject expertise, and lead the planning and development of the best and most comprehensive HE&DH related undergraduate and postgraduate programmes on the UK and potentially the World to provide modern young professionals. We also aim to plan and develop a series of shorter courses for the training and personal development of current professionals in industry, healthcare, research to renew this workforce with state-of-the-art skills and knowledge.

Our long-term objective (8-10 years) is to become the unquestionable authority and reference for education on HE&DH, the point of contact for industry and healthcare, as well as developing the most-desired graduates and professionals in the field.



## ENGAGEMENT

Research doesn't take place in a vacuum and engagement with stakeholders outside of higher education is how we ensure our work is prioritised, developed and designed with impact and translation at the forefront.

The Engagement Delivery group will equip IHE members with the skills and knowledge to develop strategic approaches to engagement through a three-strand strategy providing development, opportunities and a supportive culture for high quality, research-based engagement approaches.

This work has already started, with two flagship development opportunities. In October 2020 we had the first intake of fourteen Impact Fellows, taken from across IHE specialties and provided with formal and informal training, mentorship and support to develop their activities and approach. This is complimented by the IHE Engagement Training Syllabus, providing two-hour introductions across a range of engagement practice, always linked to further specialist sessions and support. Both of these will be repeated and built on annually.

Linkage is a major part of our medium-term strategy, the IHE is already host to outstanding practice and role models, as well as to many staff who are interested in getting started in engagement practice. The Engagement Delivery Group will be working with existing people, opportunities and teams across UCL and wider to ensure good practice is rewarded and communicated to others, with clear signposting to make getting started and developing practice easier by plugging into the IHE network.

These strands feed into to our long-term aim to further the supportive environment for engagement, recognising and rewarding practice adequately and addressing barriers from the management level, signalling its importance to the Institute's core values. This will involve a range of long-term approaches, but one first step is the work of our Co-Chair Clare Elwell with appraisal and promotion processes, making sure engagement is reflected there in process and practice. The group will seek to practice as we preach, working with IHE staff and students, and our friends and partners working with the Institute, to inform, communicate and evaluate our approach.



## GLOBAL

The IHE Global Delivery Group has established 5 key challenge statements for short-, medium, and long-term objectives set out in the IHE strategy document. These challenge statements are: 1) Create International and National Networks, 2) Identify Funding and Translational Landscape, 3) Capacity Building, 4) Identify Unmet Needs, 5) UCL Mapping and Sourcing Activities.

Each of these are mapped to a series of tasks and key stakeholders. Outputs of 1 and 2 align to short- and medium-term strategic objectives of evidencing outcomes, engaging industry, international, interdisciplinary collaborations with the aim of securing major grants and patent filing. Outputs of 3, 4, and 5 align to medium- and long-term strategic objectives of growing the IHE-associated patent portfolio, with strengthened industrial collaborations, establishing a profile for leveraging larger-scale project centres, and demonstrable impact to showcase to strengthen impact with external stakeholders.

In order to realise these challenge statements, a long-term and wide-ranging data collection and mapping exercise is to be initiated. Data mapping will be undertaken of UCL, national, and international collaborative global health-engineering related research activities (including innovation, business, policy development, and charity initiatives) and their instigators and associates (researchers, clinicians, stakeholders, end-users). The main aims of this mapping exercise will be to: a) Facilitate global networks, b) Identify the landscape for international, cross-disciplinary projects, c) Generate ideas for capacity building and development, and d) Build ongoing database of international/national collaborations/networks and successes.

Data collection and mapping will be undertaken via an entry-level customised questionnaire associated with an annual Global Health Symposium (GHS). The annual GHS will comprise targeted keynote topics and workshops aligned towards generating outputs spanning the 5 CSs. Data outputs associated with expertise, research activities and workshops will be communicated back to end-users and stakeholders via dedicated website and used to create an interactive visual “global map” of activities. The global map of activities will be projected during the (non-virtual) Symposium onto the walls of the setting to aid networking and collaborations, and during the (virtual) Symposium as a dedicated link for attendees to access via the website to create customisable maps. End-users can create customised global maps of activities filtered by research collaboration, research topic, Industry/spinouts, and pipeline discussions.

The global map will be updated annually/biannually at each data-collection time point. Exit-level data collection and feedback will also be built into the IHE-Global initiative in order to iteratively tailor the activity map to meet the needs of the end-users and stakeholders as well as to meet the IHE strategic long-term objectives.



## RESEARCH

Research in healthcare engineering and digital health takes place across UCL, led by many world-leading individuals and involving teams across and beyond UCL. The Institute of Healthcare Engineering facilitates research by raising awareness of funded research opportunities, organising events that develop interdisciplinary skills and knowledge, creating networking opportunities, pump-priming selected projects, raising the external profile of UCL's research in healthcare engineering and digital health, and signposting the research infrastructure that is necessary to complete the pipeline from foundational research to impact on clinical practice.

In the short term, IHE has worked with the Rosetrees Trust to pump-prime four projects (through a competitive bidding process involving peer review) and defined a research strategy (see four themes above) that is focused, inclusive, and represents core values such as strong foundations and impact on practice. In the longer term, we will seek out future opportunities to do similar, while learning from each experience.

Another near-term initiative is a mapping exercise to identify areas of particular research strength across UCL, to facilitate networking and targeted messaging (e.g., around specific funding opportunities).

In the short and medium term, we will also be mapping out the research infrastructure available across UCL to support research in healthcare engineering, such as research IT services, support for obtaining regulatory approval, knowledge of relevant standards and evaluation methods, and clinical trials.

In the longer term, we will build on research strengths across UCL so that UCL is, and is recognised as, world leading in healthcare engineering and digital health.

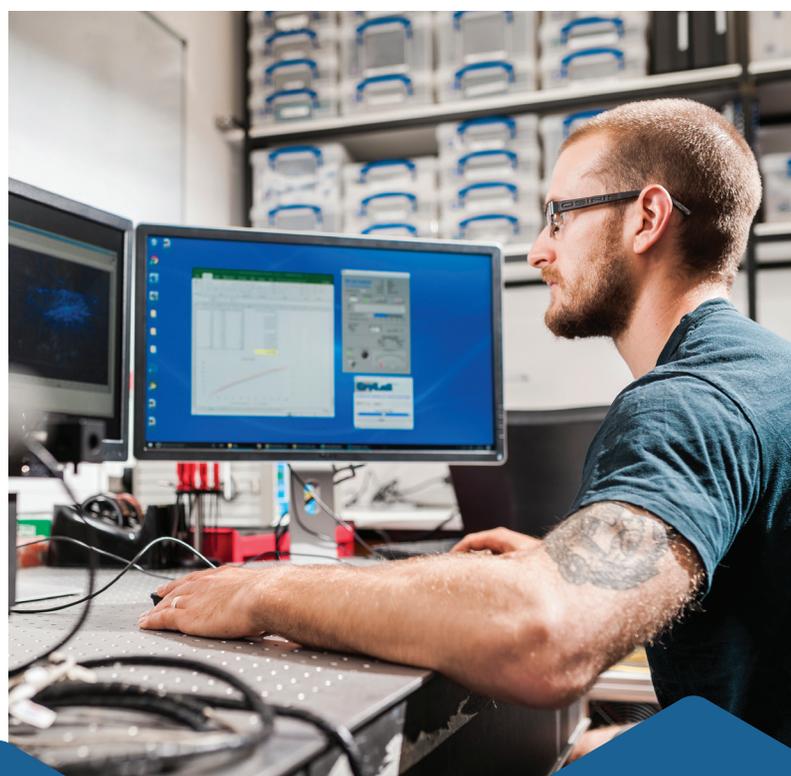
## TRANSLATION & INDUSTRY

Our short-term objective (within 2 years) is to lead industrial engagement on behalf of the IHE. We are pursuing this initially by setting up a series of workshops with a translational and industry flavour, in addition to addressing the challenge of understanding the breadth of translational research at UCL by initiating mapping activities, starting with understanding better where the hotspots are for industrial collaboration in healthcare.

In the medium term (within 5 years), we aim to make demonstrable progress in translating new technologies into healthcare, across a range of technology readiness levels. As an example, we have been involved in the set-up of Queen Square Analytics, a new UCL spin out, and intend to help nurture multiple such initiatives.

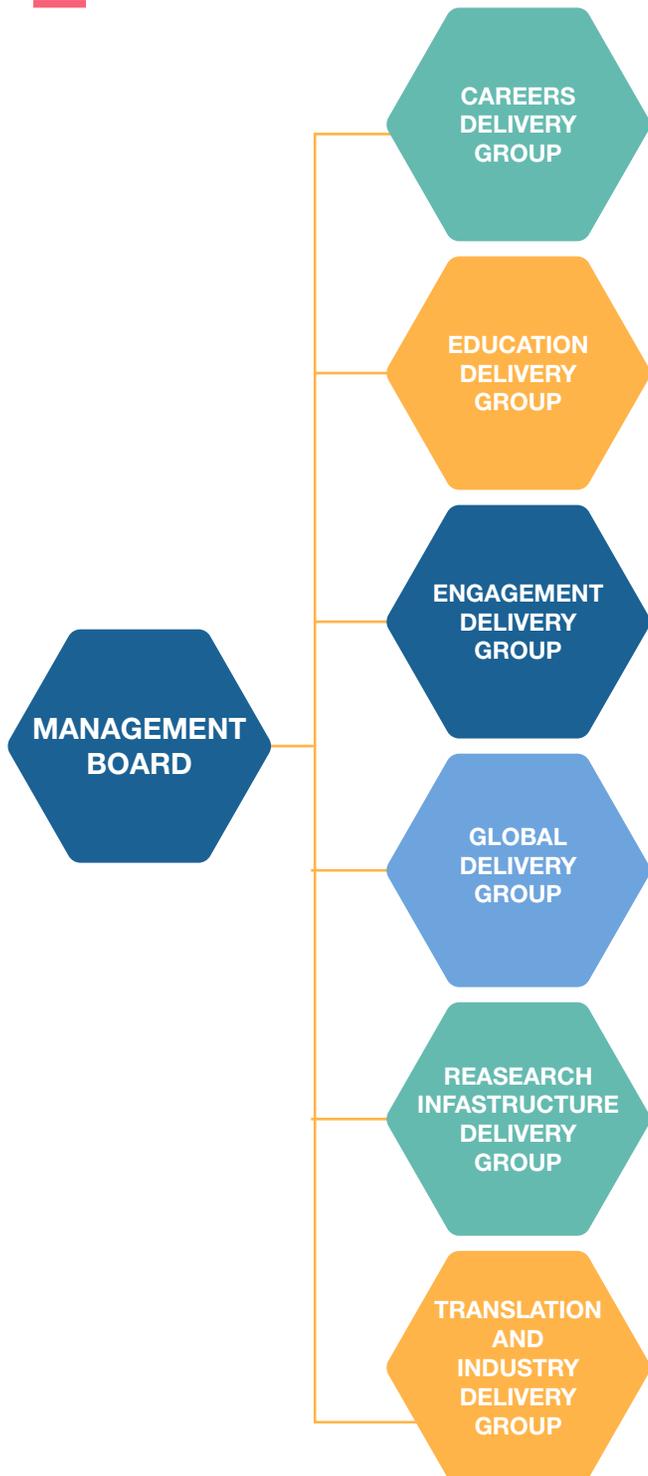
Furthermore, we recently extended our ability to engage clinical researchers by linking up with the UCL Therapeutic Innovation Networks (TINs), welcoming the Devices and Diagnostics TIN into our Delivery Group and in the process expanding our membership to include more representation from the Translational Research Office. An illustration of how this synergy assists in our objective is the recent, well-received 'Dragon's Den' event that we ran to identify new promising technologies in the devices and diagnostics area, resulting in pump-priming funding of seven projects led by UCL early career researchers.

Our longer-term objective (within 10 years) is to create one or more internationally-recognised UCL centres of excellence with a translational emphasis. We are currently working on three major themes with this aim in mind, each with a different balance of academic, clinical and industrial involvement. The first of these is the creation of a central resource for researchers who are developing a novel medical device. The aim is for this resource to help UCL researchers develop their medical devices in a way that means they will be ready for adoption in the clinic, whether via collaboration with industrial partners or with hospitals. The second is the development of a national research network for nerve engineering, which aims to establish the UK as the leading environment for this rapidly developing field. The third is the promotion of a unique new centre to enable the rapid adoption of new imaging techniques for neurology. In the short term we are seeking external funding to support these initiatives with the aim of long-term sustainable support.



# ENABLING ACTIVITIES

## GOVERNANCE



## PEOPLE and WORKING CULTURE

At the IHE we have a working culture of respect, openness and inclusivity. Our community is guided by this ethos and draws its strength from its diversity of backgrounds, disciplines, career-stages, perspectives and experiences. Interdisciplinarity is at our core and our work involves the collaboration of different groups locally and internationally. We are committed to providing opportunities for development for our staff.

- Work strategically across UCL to inform new academic staff appointments associated to, and aligned with, the first six strategic objectives and our priority areas
- Support career development and training opportunities for all staff and career stages – academic and professional services team
- Create a working culture where community members listen to and respect other points of view, are open to opportunities for learning, provide constructive and kind criticism, contribute to an environment of trust and safety, and commit to fair workload distribution
- Work collaboratively with Equality, Diversity and Inclusion teams
- Build capacity in team and build cross-institutional links so that IHE can be agile and responsive to short-term funding calls
- Embed a commitment to policy impact as a future component of our team and culture

## FINANCE

The IHE is core funded by the UCL Faculty of Engineering Sciences. To deliver on the IHE's potential, we must explore new sources of income to both build capacity in the core teams, and to fund IHE-led initiatives. Examples include:

- Charity sources for dedicated IHE-led funding calls (a recent example of IHE success in this area being the Rosetrees Trust-IHE annual call for accelerating translation of healthcare engineering research - £200K pa with matching)

- Philanthropic funding (philanthropists, industry, alumni), working with the OVP (Advancement) Health teams
- Industry funding, working with the OVP (Innovation & Enterprise), to identify potential corporate and industrial partners, benefactors and philanthropic funding sources (links to our sixth strategic objective)
- Clear guidelines for what support is available from the IHE PS team for the IHE community, how it should be sought and acknowledged (including costing the team into grant bids to enable capacity building)
- In-kind partnerships with industry to meet specific challenges, such as the IHE collaboration with Mercedes HPP to develop the Ventura CPAP device

## INFRASTRUCTURE

We must work collaboratively across UCL and our hospital partners to drive infrastructure investment, including both estate and supporting services (e.g. IT systems, research infrastructure), necessarily for us to deliver our first six strategic objectives, galvanise the full potential of our healthcare engineering community, and communicate its impacts. These will include:

- Scoping and driving opportunities for co-location of interdisciplinary research, innovation and educational activity via dedicated hubs, working both with UCL and our partner hospitals (e.g. Royal Free Hospital, Royal National Orthopaedic Hospital, Moorfields Eye Hospital, Great Ormond Street Hospital, University College London Hospital)
- Supporting FES leadership in developing and driving the Faculty estates plans
- Working with OVP (Health), OVP (Research), Research IT Services and UCL-associated Biomedical Research Centres to drive IT infrastructure and standards development to enable researchers to work with the increasing volume of patient data available through our partner hospitals
- Collaborating with the OVP (e.g. Research, Innovation & Enterprise) and UCL Professional Services teams (e.g. Research IT Services, Library Services) to develop the digital infrastructure to enable robust tracking of IHE activities and subsequent impacts (e.g. research paper citations, funding, industry collaborations)

## COMMUNICATIONS

Communications is a core enabler to build the IHE community and raise our profile amongst key stakeholders. Our communications allow us to present IHE as the shop window to UCL's healthcare engineering activity and to create a consistent, engaging 'brand personality'. Effective communications projects our values, accelerates our impact and enables us to compete effectively for the best funding and to recruit the best staff, students and partners into our community. Key tools include media, website, newsletters, social media, videos, reports and events.

- All communications outputs will be underpinned by messaging that reinforces a sense of IHE's core brand values and identity: Collaborate, Innovate, Translate
- Events series build our audience and are a key method for encouraging interdisciplinary connections and disseminating knowledge including Colloquium Talk series, Research Workshop series, Annual Symposia (Global and Autumn Research), ADAPT to Thrive series
- Internal communication allows us to disseminate information of strategic importance in a timely manner, leverage the excellence of members to fulfil our objectives (e.g. their engagement in our delivery groups and activities), grow the IHE membership to span interdisciplinary groups and Faculties pan-UCL, celebrate the achievements of our community and inspire others
- External communication helps us to increase our visibility and cement our reputation as the heart of UCL's healthcare engineering excellence, innovation and community. This gives weight to our funding applications and helps us attract the best partnerships (clinical, industry, charity, government) that can accelerate our research and its translational impact
- Has an educational value in informing audiences with an accurate understanding and awareness of our research areas and their impact e.g. informative case-studies, news stories and videos



Website: [www.ucl.ac.uk/healthcare-engineering](http://www.ucl.ac.uk/healthcare-engineering)

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