

CoRE approved for funding!

We have great news to report in this second edition of CMDT Quarterly – the MedTech Centre of Research Excellence (CoRE) proposal has been approved for funding! Many CMDT members contributed to the proposal and we can all take credit for the successful outcome. Of the 26 applications, including those from the existing 7 CoREs for continued funding, 8 were shortlisted for site visits and 6 made the final cut. The successful CoREs are listed here: www.tec.govt.nz/Funding/Fund-finder/CoREs/Current-CoREs.

When the CMDT was established as a networking organisation four years ago we envisaged that as well as providing a clinical and business facing organisation for the scientists and engineers working in bioengineering and medical device technologies, it would be an appropriate platform on which to base a CoRE application to provide a translational science engine behind CMDT. The success of this application, together with the collegial and inclusive network we have achieved through CMDT, gives us a wonderful opportunity to establish Medical Device Technologies as a significant contributor both to health outcomes in New Zealand and, through existing MedTech company linkages and new commercial initiatives, to the New Zealand economy.

The MedTech CoRE has five *Themes* aligned with the CMDT (www.cmdt.org.nz/research-themes):

- Diagnostics and Therapeutics
- Interventional Technologies
- Assistive Technologies
- Telehealth and Health Informatics
- Tissue Engineering for Regenerative Medicine

It will support six *Flagship Projects* that have well developed science and clinical engagement, and five *Technology Platforms*, as well providing substantial funding for a number of new *Seed Projects*, selected on a competitive basis from proposals submitted by our (large!) team of AIs. It will also support *Internships*, a new *Doctoral Training Programme* and an *Industry Training Programme*. More details on all of these activities will be posted on the CMDT website

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shortly.

Professor Peter Hunter from ABI at the University of Auckland will be Director of the MedTech CoRE. Professor Geoff Chase from Canterbury University and Professor Merryn Tawhai from ABI will be Deputy Directors. Other key roles from among the group of 17 PIs are:

- **Dr Di Siew** - Associate Director, Callaghan Innovation (Industry Engagement and CMDT)
- **Dr Anthony Butler** - Associate Director, University of Otago
- **Professor Kathryn McPherson** - Associate Director AUT (Clinical - Rehabilitation)
- **Professor Simon Fraser** - Associate Director, VUW (leading Design aspects of the CoRE)
- **Professor John Windsor** - Associate Director, University of Auckland (Clinical – Surgery)

Funding for the new MedTech CoRE does start until 1st January 2015, but we will be doing everything we can this year to make sure we get off to a flying start at the beginning of next year!

Peter Hunter and Diana Siew, CMDT Co-Chairs

Chris Somogyi “Going global from day one of design”



The new head of Accelerator Services at Callaghan Innovation, Chris Somogyi, comes to us with over 30 years experience in the commercialisation of medical technology innovations, so for the

Med Tech industry in New Zealand, he is a particularly valuable addition. A quick Google stalk of Chris reveals his breadth of experience in our industry, beginning with a solid academic grounding in Bioengineering (both bachelors and masters degrees), and business (MBA), 7 issued US patents, and experience as a founder and CEO of companies, he has also served on the Board of Directors for many companies, and invested in many Med Tech companies worldwide as an angel and venture capitalist. Frankly, it is a little intimidating! Needless to say he will be a valuable asset to NZ and I was very happy to have the opportunity to have him opine on the Med Tech industry in New Zealand.

When I asked him what his views were on the biggest challenge facing the NZ Med Tech industry, his response was “to go global from day one in design, in channel access, and in regulatory compliance”. With much of his experience US based, Chris is only too aware of the regulatory and reimbursement complexity there – “the FDA process can be quite arduous” he says, highlighting the importance of planning for gaining compliance right from the outset.

Chris sees that one of the main competitive advantages of being a Med Tech company in New Zealand at the moment is the people, with “generally creative staff” who have “decent awareness of global suppliers and customers”. Another clear advantage, particularly as compared with the US, is the less litigious environment here in NZ. He notes that this makes New Zealand an attractive test bed for new devices and technologies as well – “The litigious environment in the US increases cost and complexity of development”. He notes that as a result of this, “many US companies have elected to go to Europe first with their innovations”.

That said, there are some things to be learned from the US Med Tech sector “Some key trends [in the US] for some time now have been cost containment and smart devices that require less advanced medical training to operate”. For companies considering expansion into US markets, there are a number of things to consider. “In the US there is a special medical device tax, and much higher deductibles have a chilling effect on patients seeking care, resulting in a lower demand for expensive new technology. The reimbursement assessment process by insurers can also be slow.” The introduction of health care savings accounts means that consumers in the US now have greater control over the kinds of treatment they seek and greater awareness of how much they pay for treatment. Consequently, it is really important for Med Tech companies to “embrace consumer driven healthcare”.

To hear more from Chris, particularly about new processes and products to support NZ’s technology and business innovation needs, keep an eye out for him at the [Healthcare Congress 2014](#) next month.

SENSING CITY

One of the many positive outcomes of the Canterbury Earthquakes is the creation of [Sensing City](#). Co-located with Callaghan Innovation in the downtown EPIC building, Christchurch's Sensing City have a front row view of the rebuild going on around them and have big plans for the city's future. Their goal is to create a data export industry for New Zealand that is based on a city-wide data service platform which can provide access to a range of city data sets from multiple sources.

One of the first projects to kick off is the Health Informatics project – an exciting endeavour which involves a multi-disciplinary collaboration between Sensing City and a group of CMDT partners: the [Canterbury District Health Board \(CDHB\)](#), the [University of Canterbury](#), [Callaghan Innovation](#) and NZ MedTech company [Nexus6](#).

Nexus6, whose aim is to increase patient adherence to medications and to improve the lives of people with Asthma and COPD

through the use of proactive monitoring, produce a range of instrumented Smartinhaler™ which track medication use in real time. The CDHB will recruit patients who suffer from chronic lung disease and provide them with a Smartinhaler™ - every time the patient uses the inhaler, the amount of medication dispensed, the ambient temperature and the GPS location of the inhaler are recorded and uploaded to a data base. A unique feature of this project is that it will also include monitoring air quality via air quality sensors deployed around the city. The data from the Smartinhaler™ and the air quality sensors will be aggregated. Using some pretty fancy computer modelling, the team will be able to test whether monitoring patient medicine use and the quality of air they experience can enable clinicians to better manage patient healthcare.

University of Canterbury and Callaghan Innovation's Medical Device Technology Group will combine the multiple data sets, and health surveys to better understand the spatial distribution of medication use and how this is affected by air quality. This partnership enables techniques to be developed that will ensure participant privacy before the first patient is issued with a device, while still allowing extraction of health analytics that will benefit clinicians, patients and researchers trying to understand how to manage chronic health conditions.

Chris Stevens, Chief Operating Officer at Nexus6, explains how this derisks their

further innovation around big data. "Sensing City are proving the technology. There is all this R&D that has to happen along the way – we had to add temperature sensing and GPS [to the Smartinhaler™] and make sure the data flows work properly. Sensing City will have the anonymised GPS data and the CDHB have patient data so we have to make sure those two things are separated properly. It gives us a chance to prove the technology but then also confirm the hypothesis that useful data comes out of it, so from that point of view it's a great project for us."

Reflecting on this Chris says, "The nice thing about the project is that there are two arms to it – the Sensing City big data side and the partnership with Canterbury DHB, in a clinical research type environment. Maybe it turns out it doesn't matter how hard the patient tries, if they live in a certain type of environment they are always going to have difficulty managing their condition. We don't know yet, but the key thing is let's get all the data together and see if there is something in there."

This project is a great example of how several research teams can come together to benefit the Med Tech industry in New Zealand, to advance science, and to help Sensing City demonstrate the high-value, cross-sector, and often unanticipated benefits that arise when real-time data sets are made easily accessible for public consumption in combination with seemingly disparate or previously unlinked data sets. So...watch this space!

NZ Healthcare Congress 2014



It is that time again – the [NZ Healthcare Congress 2014](#) is just around the corner!

This is the main conference for the Med Tech sector in New Zealand and is a great forum for hearing about the latest developments, research projects, industry trends, and of course for meeting and networking with potential investors.

In conjunction with the [Medial Technology Association of New Zealand](#), and [New Zealand Health IT](#), the Healthcare Congress runs on June 10 and 11 at the Langham Hotel in downtown Auckland. Transformation is the theme of the congress and it includes a multi-streamed programme that will have something for everyone.

There will also be new interactive events, including a "meet the buyer" programme facilitated by MBIE, this is essentially speed dating for business looking for buyers; some "healthy debate", with key healthcare spokes people from each political party being invited to engage in debate critical issues and answer your burning questions on their proposed health platform; and a panel of clinicians will be assembled to provide feedback from the frontline, offering insights from the clinical perspective on what works, what doesn't and where the opportunities lie. For more information and programme details, check out the 2014 Healthcare Congress [website](#).

HealthTech Workshop



As a chaser to the conference, Callaghan Innovation is hosting the HealthTech Innovation and Investment Workshop on the 12th of June at the Hilton Hotel.

Developed in conjunction with NZTE, ATTED, CMDT, KiwiNet, Return on Science and CRIS, the workshop provides a forum for companies and entrepreneurial clinicians and scientists to meet a group of investors from the US. There will be seminars, Q&A sessions, and importantly, the opportunity to deliver the elevator pitch for your product or research to potential investors. To register, click [here](#).

Hope to see you all there!!

The Musculoskeletal Atlas Project (MAP)

Our ageing and increasingly overweight population is giving rise to an epidemic of musculoskeletal and movement disorders, such as osteoarthritis, osteoporosis, and stroke. The demand for joint replacement surgery, for example, is predicted to skyrocket by 673% in the US by 2030. The associated health care cost of these disorders is tremendous, so we must look towards novel approaches to tackle these problems. Medical devices offer one way to improve the diagnosis, assessment, and treatment of musculoskeletal disorders and NZ has a growing [medical devices industry](#). The Medical Technology Association of NZ (MTANZ) estimates that NZ's medical devices sector contributes \$1.4bn to our economy, which is projected to double in the next 3 to 5 years.

Computational modelling plays an important role in our understanding of the form and function of the musculoskeletal system. Just as mathematical modelling revolutionised the aeronautic industry, computational modelling is dramatically influencing the design and validation process of medical devices, particularly in the field of orthopaedics. Computational models also have tremendous potential to complement clinical trials, reducing the cost of bringing a new product to market through *in silico* testing across a virtual population. Herein lies the concept of the *Virtual Clinical Trial*.

An orthopaedic device manufacturer might be faced with several important design questions. Firstly, who is the intended user of the device? What is their size, age, sex, or ethnicity? Secondly, what kind of loads or boundary conditions is the device designed to operate? How might the device function across a population of individuals? And lastly, how do they ensure that simulations are valid for the range of conditions tested? The ability of computational models to predict clinical or functional outcomes is dependent on the ability to accurately capture the complex geometry of the musculoskeletal system and the ability to describe appropriate loads and boundary conditions (i.e. muscle and joint forces). Image-based subject-specific models of the neuromusculoskeletal system are capable of estimating *in vivo* joint loads and show much promise for predicting functional or clinical outcomes. Unfortunately, creating such models is time-consuming, costly, and requires a very high level of expertise. Getting access to quality imaging and functional data for a large cohort also takes considerable effort and cost.

The scientific and medical device community would benefit greatly from a population-based anatomical and functional atlas to rapidly

generate subject-specific models of the musculoskeletal system. Researchers at the Department of Engineering Science (A/Prof Thor Besier and Prof Poul Nielsen) and Auckland Bioengineering Institute (Prof Peter Hunter) have received funding from the US Food and Drug Administration (FDA) to develop an open-source software framework, called the *Musculoskeletal Atlas Project* (MAP). The long-term goal of this project is to facilitate virtual clinical trials to reduce the cost of clinical trials and streamline the regulatory process for medical devices in orthopaedics. The project leverages from software tools developed for the [Physiome Project](#), and uses statistical shape modelling to rapidly generate accurate models of bones, muscles, and soft tissue structures from medical imaging data. Postdoctoral research fellow, Dr Ju Zhang, has implemented his automated segmentation algorithms within the MAP to generate a population of more than 300 lower limb bones from CT images (*Figure 1*).

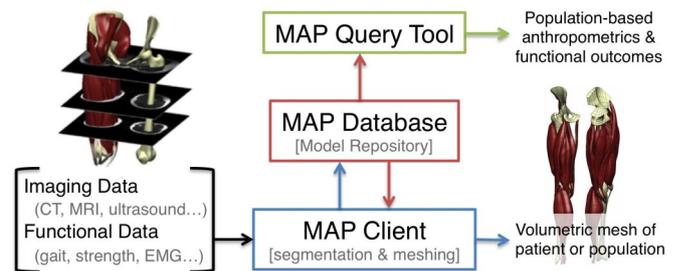
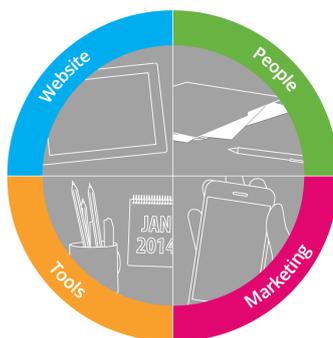


Figure 1.

Lower limb muscle and joint forces for various activities of daily living will be included in the database to provide orthopaedic researchers with realistic loads and boundary conditions. To facilitate exchange of data and models, accelerate validation and provide robust peer review, the MAP database will be implemented within the *Physiome Model Repository* (<http://www.cellml.org/tools/pmr>). Using these software tools, we will engage the biomechanics community to build the MAP database and provide a unique resource for population-based orthopaedic modelling and *in silico* testing and validation. A/Prof Besier will present this work in July this year at an invited symposium at the World Congress of Biomechanics in Boston.

The Digital Journey



Given that a first port of call for anyone interested in your business is often the internet, a question NZ Med Tech firms should be asking themselves is “is my business using the Internet as effectively as it could be?” The [Innovation Partnership](#) recently released research findings which indicate that NZ businesses could add as much as \$34 billion to the NZ economy simply by making

better use of the Internet. Using the Internet effectively is more than just having a website and using social media as a marketing tool (although research also shows that NZ businesses often haven't even mastered these basics).

Digital Journey (digitaljourney.co.nz) is a tool which provides NZ businesses a free assessment of how accomplished they are at using the Internet. It takes about ten minutes to run through and asks a series of questions around not only your website, but also around ICT training, planning, ICT tools, and online marketing.

At the end of this assessment, you'll be provided (for free!) an action plan for improving your organisation's technology use. There are also plenty of free resources available on the digital journey website. Stuart Dillon-Roberts, the GM of [Digital Office](#) (the team behind

Digital Journey) explains why he has spent the last six months focusing on this project “We believe that using the internet well, is critical to the economic growth and prosperity of New Zealand. This is our sole purpose to help NZ business unlock the value of the Internet.” Digital Journey launched only a little over a month ago is already having an impact: “Even in this short time since the service has been operating we have heard from businesses who have decided to look into using ecommerce solutions, increase their online profile or make a clearer technology plan for their business. This is exactly what we want to achieve to help NZ businesses prosper, open new markets and remain productive.”

“How is something this amazing free?” you might be asking yourself. The initial funding that supported the development of Digital Journey came from Google and InternetNZ. Ongoing support for marketing and running Digital Journey events will come from sponsors, who so far include MBIE and Callaghan Innovation, as well as training support from organisations such as the Otago Polytechnic.

“Using the internet is so important for businesses to stay relevant to their customers, grow and remain productive” says Dillon-Roberts, “it's important to the viability and relevance of a business that they regularly review the use of the internet to stay one step ahead of their competitors, meet the needs of their customers and assess how traditional businesses processes can be improved through online tools.” So go ahead – [check it out](#) and get started on your own digital journey to improved productivity and profitability!

In other news...

Study raises doubts about iPhone-connected blood pressure cuffs



Article by: Satish Misra, MD
Source: <http://www.imedicalapps.com>

At this week's American Society of Hypertension (ASH) meeting, two studies will be presented evaluating the use of web-based instructional material and smartphone-connected blood pressure cuffs for the management of hypertension. The findings reported in these two studies are poised to raise doubts about the quality of these tools.

In one study, Dr. Nilay Kumar of the Cambridge Health Alliance evaluated YouTube videos that represented themselves to be educational material related to hypertension. In the other, Dr. Clarence Grim, a healthcare consultant, compared the readings from the Withings and iHealth blood pressure cuffs to manual measurements.

[Read more...](#)

Crowdfunding 101: Pros and Cons

Source: *Stanford Graduate School of Business*

Private equity, the domain of Vanderbilts and Warburgs, brought a new form of financing to the 1940s. With all its large minority positions and lucrative fees, venture capital hit its stride in the 1970s. The turn of the century popularized the image of the brilliant, yet narcissistic independent angel investor. Now, with the recent JOBS Act and a nudge from Capital Hill, will 2013 will be the year of crowdfunding?

As startup costs decrease and information flows more freely, each generation brings a suitable new form of fundraising. Crowdfunding is the latest in the pantheon of inevitable funding innovations. Outside funding from non-accredited investors is not quite legal in the US (sites such as Kickstarter and GoFundMe attract funding for projects with no promised equity) but this will soon change. With the advent of crowdfunding, more entrepreneurs will get funded and more investors will share in wealth creation, so what's the downside? It's tough to tell at first...

[Read here](#) about the pros and cons.

It's all about the user— designing user interfaces for worldwide mobile health

Article by: Steven Chan (@StevenChanMD)
Source: <http://www.imedicalapps.com>

Stickiness—the great challenge of mobile health projects. One significant criticism of mobile health is the sheer number of “pilot” projects inundating the third world. Some countries, like [Uganda, have even called for a moratorium on such projects](#). A [recent PLoS Medicine paper](#) noted that “in 2008 and 2009, approximately 23 of 36 mHealth initiatives did not move beyond the pilot phase.” [Even PLoS Medicine's editors](#) have called for a technical reality check for researchers to continue the advancement of mobile medical projects, questioning the interoperability, open standards, and evaluation methods of mobile health projects.

One thing missing from this checklist: the user experience.

[Read more...](#)

And finally...



Harvard woman figured out how to 3D print makeup from any home computer

Source: <http://www.businessinsider.com.au>

Outside the box thinking on the use of technology. Not quite Medtech but, could spark a smile or idea...

[Read more...](#)

Do you have a story for our Newsletter?

If you would like to contribute to the quarterly CMDT Newsletter or have a story you would like to share, please email the details to:

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