

A DAY IN THE LIFE

The DITC is quite an unusual entity to be perfectly frank! The Centre, at King's College London's Dental Institute, was created in 2013 to fulfil a very specific function. There are two ends to the process where science meets technology to improve health. At one end of the journey you have the bright scientists and innovators who have the eureka moments and come up with ideas they believe will be useful. At the other end there's the technique or product which has been tested and trialled on humans and is then, hopefully, translated into everyday routine care. The journey in between is not

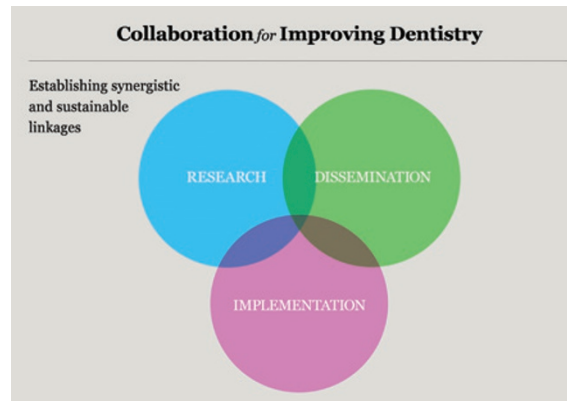


a linear, predictable or quick procedure, but there are many people currently working in the middle of that space.

So here at the DITC in King's, there's a focus on the two extremes. The *innovation* end, to get some excellent ideas with the potential to improve health and healthcare and the *translation* part, where we identify solid evidence that should be incorporated into everyday routine practice. It is my job as the Director of the Centre to bring those two worlds together. We want to put scientists, clinicians, policy makers and, where appropriate, industry, in a room together and let them interact to build an understanding and make partnerships. Then we have a group of scientists looking at creative ways to solve real problems, rather than invent a black box and then say 'OK, what do we do with that?', which can happen!

AT THE CENTRE OF INNOVATION

If I asked you what a Dental Innovation and Translation Centre was, my guess is very few could tell me with any degree of accuracy. It doesn't involve making things and changing language, but what it does do is bring together some of the brightest innovators and communicators to make a difference within the healthcare world. For **Professor Nigel Pitts**, it's all in a day's work, so News Editor David Westgarth caught up with Professor Pitts to ask what a day in the life of the **Dental Innovation and Translation Centre (DITC) at King's College London** looks like.



The translation part and the development of 'implementation science' is also fascinating. There are some fantastic minds looking systematically at the barriers and facilitators that innovators face in completing the journey from idea to implementation. What we want to know, on a global basis, is what makes clinicians and health services move to introduce beneficial changes?

Given the specific nature of the Centre and the challenging nature of what he's trying to achieve, Nigel explained what a typical week may look like

I can say with great certainty that no two days are ever the same. I am in a very privileged position of interacting with many scientists and technologists as well as clinicians. In our priority areas, I work with some of the brightest people in London, Scotland and across the globe and help in facilitating and moving forward their ideas. I'm often in meetings to help develop new science and see how promising new technologies can be translated from basic science to practice, policy, or product. These meetings can be face to face, by phone conference, or by video conference; travel is also very much part of the mix.

In contrast, we are also involved in working with various health services, across the UK and internationally; looking for example at how their surveys can best be

structured to give us all better epidemiology data on the prevalence and distribution of oral disease.

I asked if the model of research-to-dissemination-to-implementation was the way forward

There is a great level of expertise in the *research* domain, with a huge scope for collaboration to improve dentistry, oral health and health. In terms of *dissemination*, there is a problem in that many of those scientists and researchers aren't great communicators outside of their peer groups. Don't get me wrong, there are some excellent scientists also involved in communication, but the two groups can be a bit like chalk and cheese. It's the third group, those delivering effective *implementation*, who are the hardest to find. They are almost like the glue that bonds the first two groups together. Globally, there are a number of structured attempts to improve the communication between these three groups, in the hope of ultimately improving healthcare and the healthcare industry. The process is not a linear one, there has to be regular overlap and three-way traffic.

Surely there must be some problems with this approach?

Dentistry has a fabulous range of expertise and, supposedly, we speak the same language. However, as each group has its own silo and its own impenetrable jargon, cross-group communication has become a major challenge. Many fundamental issues and barriers I come across on a daily basis relate to communication failures. Finding a way of getting these different groups to communicate effectively over a sustained period is difficult.

There is also often a great degree of tension when it comes to finding a 'safe place' for cross-group conversations to happen. There are so many political, financial or historical barriers to overcome before even stepping into a room together, and more often than not people enter in 'negotiating mode'. It's our job to find some neutral territory as a basis of exploring the issues and achieving progress. For instance, we are involved on an international level

in the running of the Alliance for a Cavity Free Future – ACFF (www.allianceforacavityfreefuture.eu). With this health advocacy charity on dental caries control, we have been keen to ensure that dentistry is not just talking to itself, but also with colleagues in medicine, governments and the wider world. After all, there's an increasing evidence base that suggests we should 'put the mouth back into the body' and target common risk factors for both oral and systemic diseases.

I then asked Nigel for an example of their work

Reminova, a new spin-out company from King's, is a great example of what we are trying to do in the commercialisation side of our work. Our model of trying to improve health remains. We are developing innovations that bring patients benefits and taking them to the market to provide clinicians with the tools they need to regain and maintain health.

We have been working with great non-medical expertise in 3D imaging and quantitation and in electrochemistry, and have brought these together with cariology knowledge to develop a way of remineralising teeth with initial-stage caries. Throughout the thought process we have always focussed on 'how can we tip the natural caries balance and change it radically, so that remineralisation outweighs demineralisation and can be done both faster and better?'

So, having created a company and built a team to take the technology forward, we looked at all funding options and one that attracted us for a number of reasons is crowdfunding. It's something that is already quite prominent in the USA, but less so in Europe. We are running this exercise simultaneously in both Europe and the US, and believe we are the first company of our kind to attempt to raise funding in this way. An advantage is that, in one sense, we already have our crowd. When we first mooted the idea to set up Reminova last year, there was such a great reception from patients, public and profession alike. Many individuals across these groups contacted us and said they wanted to help change the way we manage tooth decay. Crowdfunding is a new challenge, but it's an exciting process and, for Reminova, it is just the start.

Bearing in mind this was an ambitious way to raise funding, what did the group set as a target?

Our stretch target is £1m, but we'd be happy to hit the £500,000 mark. We have 60 days to achieve it, so we will see what happens. As we move forward into the future we are gaining a better understanding of the technology and holding more discussions with potential partners. There are many steps to take, and it's a journey. We're proud to be doing things differently and working in partnership with dentists and potential patients, as well as other investors.

With the shift towards preventive dentistry, where does this fit in their ethos?

Reminova technology provides a less destructive way to control disease, with fewer injections and fillings and less loss of sound tooth tissue; but it should come as part of an overall care package. Modern minimally invasive caries management is about being able to instil behaviour change in our patients, helping them be careful about sugar intake, use the right level of fluoride, keep up good oral hygiene and make appropriate dental visits a priority.

If there's a solution, are people going to think it doesn't matter and adopt a blasé attitude?

As many GPs will testify, there are a whole range of attitudes out there. We have to look at personalised healthcare matching the needs and expectations of different types of patients. The whole dental team should encourage and promote health maintenance, not simply attending when there's a problem. Some of our research indicates that, given a choice, the public are far keener to get into prevention, not just for themselves but also for their children.

It would certainly be sad if dentistry doesn't change and evolve, rather than being stuck using models of care and remuneration from 50 or even 100 years ago which concentrate on filling holes in teeth. With the sensible use of this type of technology, integrated into preventive care programmes globally, we should be able to improve caries care and help patients maintain health.

We now know more about the science, the needs, preferences and expectations of patients, as well as the economic and health detriments of repeat drill-and-fill dentistry. Reminova and its technology is an example of progress being made in trying to transform dentistry, I truly believe that this is the way forward.