Dentistry, Oral health and Oral Cancers

SBRI Healthcare NHS England competition for development contracts

July 2018

Wessex Academic Health Science Network

Summary

A new national Small Business Research Initiative (SBRI) Healthcare competition is being launched by NHS England in partnership with the Academic Health Science Networks (AHSNs) to find innovative new products and services. The projects will be selected primarily on their potential value to the health service and on the improved outcomes delivered for patients.

The competition is open to single companies or organisations from the private, public and third sectors, including charities. The competition runs in two phases (subject to availability of budget in 2019):

- Phase 1 is intended to show the technical feasibility of the proposed concept. The development contracts placed will be for a maximum of 6 months and up to £100,000 (inc. VAT) per project
- Phase 2 contracts are intended to develop and evaluate prototypes or demonstration units from the more promising technologies in Phase 1. Only those projects that have completed Phase 1 successfully will be eligible for Phase 2.

Developments will be 100% funded and suppliers for each project will be selected by an open competition process and retain the intellectual property rights (IPR) generated from the project, with certain rights of use retained by the NHS.

The competition opens on Monday 9th July 2018. The deadline for applications is 1200hrs on Wednesday 22nd August 2018.

Introduction & Background

NHS dental services are provided in primary care and community settings, and in hospitals for more specialised care. NHS England directly commissions all dental services for the NHS and there are over a million patient contacts with NHS dental services each week.

Dentists working in general dental practices are not NHS employees. They are independent providers from whom the NHS commissions services. They are responsible for whom they employ within their own dental teams and for the management of their practices. It is common for dental practices to offer both NHS-funded and private services.

The NHS in England spends around £3.4bn per year on dental services; the value of the private market is estimated at £2.3bn per year[1]

The NHS Five-Year Forward View[2] highlighted how technologies with the potential to improve patient care had failed in the past because they had been tried in isolation, without changes to ways of working, or on top – not instead – of existing programmes. It therefore identified the need for test areas with the willingness to adopt whole-system change, and the ability to measure benefit and pass on learning to other areas.

As with many other sectors of healthcare, dentistry often finds itself overlooked as a profession when considered against many other specialties. However, the impact of dental disease is often much deeper and widespread than is typically anticipated. In the last few years, the problems that exist within dentistry have

increased, resulting in a stronger and more prominent surge of media coverage, as many of the problems continue to worsen.

For several years dental professionals have been acutely aware that out of hours access for urgent and emergency dental care, is sporadic and commissioning for this has been difficult. Dental problems make up a large volume of 111 - out of hours calls and the call centres often struggle to manage dental concerns with both access to services and appropriate advice being central to this. So it is no surprise that the most common reason for admission to hospital for paracetamol overdose is following self-administration due to dental pain.[3]

There have been countless news stories for years on how the general population struggle to access dentists and there has also been coverage on how dental charities have had to step in to support regional services in providing access to the homeless[4]. Furthermore, the profession is struggling to recruit and train dentists to areas where they are needed and the current workforce needs support and evolution to break past the barriers that prevent it from delivering the care it is able to.

The Categories

The theme of the current competition is 'Dentistry and Oral Health' and within this topic two categories have been identified via review of key policy documents and in conjunction with key professionals and stakeholders including NHS England and Public Health England. These are outlined in detail below.

Applicants are expected to respond to one of the two categories, whilst being mindful of the broader system.

Companies applying are also asked to consider:

- How will the proposed solution impact on the clinical care pathway, and how will the care pathway need to be changed in order to deliver system-wide benefits?
- How will you ensure that the technology will be acceptable to patients (and their families) and to healthcare workers? How could these groups be involved in the development of the innovation?
- How will you ensure that the technology is affordable to the NHS both immediately and throughout the life of the product? What health economics evidence will the NHS require before the technology can be adopted?

Category 1: Improving Oral Health for Children & Young People

Background

Under the terms of the Health and Social Care Act (2012)[5] Local authorities became responsible for improving the health, including the oral health, of their populations from April 2013. From 1 October 2015 commissioning responsibility for the Healthy Child Programme for zero to five-year-olds transferred from NHS England to local government. This included the commissioning of health visitors, who lead and support delivery of preventive programmes for infants and children, including providing advice on oral health and on

breastfeeding, reducing the risk of tooth decay. Local authorities are responsible for commissioning public health services for children and young people aged zero to 19 and this provides an opportunity for councils to further develop relationships with key partners such as health visitors, family nurses, midwives, school nurses, dental teams, GPs, children's centre staff and commissioning groups.

Oral health is referenced in the 'Best start in life and beyond: Improving public health outcomes for children, young people and families' which provides guidance to support the commissioning of the Healthy Child Programme. It provides opportunities to integrate oral health improvement into service specification and an effective programme of delivery for zero to 19-year-olds. [6]

Challenges

Tooth decay:

Tooth decay is the most common oral disease affecting children and young people in England, yet it is largely preventable. Whilst children's oral health has improved over the last 20 years, almost a third of five-year-olds[7] and 12 per cent of three year olds[8] in England have experienced tooth decay. Additionally, in 2014/15 there were 33,781 cases of children aged 10 and under needing the removal of one or more teeth: a rise of three per cent on the previous year. [9]

Large numbers of young children have teeth extracted under general anaesthesia in hospital because of dental decay. Dental decay is the top cause of childhood hospital admission for five to nine-year-olds, with just under 26,000 admitted in 2013/14 making 8.7 per cent of all admissions[10] at an estimated cost of £14.5 million[11] . In 2014/15 hospital trusts spent £35 million on extraction of multiple teeth for under 18s.[12]

Children may miss school and parents have to take time off work for their child to attend the dentist or be admitted to hospital. Oral health is an integral part of overall health. When children are not healthy, this affects their ability to learn, thrive and develop. Good oral health can contribute to school readiness and the prevention of school absence.

We are looking for technologies that can help us address these challenges. However, we do <u>not</u> need more apps for general dietary advice, or those that monitor sugar consumption. What is lacking are transformative innovations that that can augment existing initiatives or develop new technologies that could improve oral health in children and young people.

Inequalities:

Ultimately, children are reliant upon their parents and the state to ensure their welfare. They are currently vulnerable to a lack of cohesion between services, and passivity in the active willingness by some health professionals to accept responsibility for children's dental health.

Recent studies[13] show that the absence of formal attendance at a dental surgery and having a universal health record that is accessible by all of those responsible for child health and welfare, means a child's dental health within the NHS system may be neglected, its importance undermined and the timely detection of dental issues can therefore be impaired.

There are regional variations in oral health, 21 percent of five-year-olds had tooth decay in south-east England compared to 35 percent in north-west England with even greater inequalities within local authorities. [7] A recent survey of three-year-olds in England found that 12 per cent had tooth decay ranging from 34 per cent to 2 per cent across local authority areas. There is a similar picture in five-year-olds where across local authorities in England the variation ranges from 13 per cent to 53 per cent having experience of tooth decay, these children have on average three teeth affected.

Children living in deprived communities, particularly those with disabilities, have poorer oral health than their more affluent peers. Poor oral health can affect children and young people's ability to sleep, eat, speak, play and socialise with other children. Other impacts include pain, infections, poor diet, and impaired nutrition and growth. [14]

The Child Dental Health Survey 2013, England, Wales and Northern Ireland found that children who were from lower income families (eligible for free school meals) are more likely to have oral disease than other children of the same age.[15] A fifth (21 per cent) of the 5 year olds who were eligible for free school meals had severe or extensive tooth decay, compared to 11 per cent of 5 year olds who were not eligible for free school meals. Similarly, a quarter (26 per cent) of 15 year olds who were eligible for free school meals had severe or extensive tooth decay, compared to 12 per cent of 15 year olds who were not eligible for free school meals.

Improving Communication between Dentistry, GPs and Secondary Care

GPs have more contact with families than dentists and if, as their default role as frontline workers of the NHS, GPs are to bridge the current gap in dental service provision, they require sufficient knowledge and training to recognise signs of oral disease and neglect. To date no studies have been undertaken that specifically examine the role of GPs in identifying dental neglect in children. It is not mandatory for parents to take their child to the dentist in the UK and yet often GPs are the first point of access to the NHS. In the absence of the dentist, recent research by the British Dental Association[16] demonstrates that GPs lack training and confidence in identifying dental neglect during routine examination of the oropharynx. GPs also lack an awareness of dental neglect as a potential marker of wider systemic child neglect.

In a recent study by the British Dental Association[16], half of the GPs did not know the identity and location of dentists within their patients' geographical area. The majority of GPs (91%) had never liaised with their dental colleagues regarding the care of a mutual paediatric patient

60% of GPs reported that they did not formally examine teeth even when examining the throat of a child and 67% of GPs do not routinely comment on their patients' dentition. Time constraints and lack of training in dentistry were the two most commonly disclosed impediments that prevented the GPs from routinely examining children's teeth.[16]

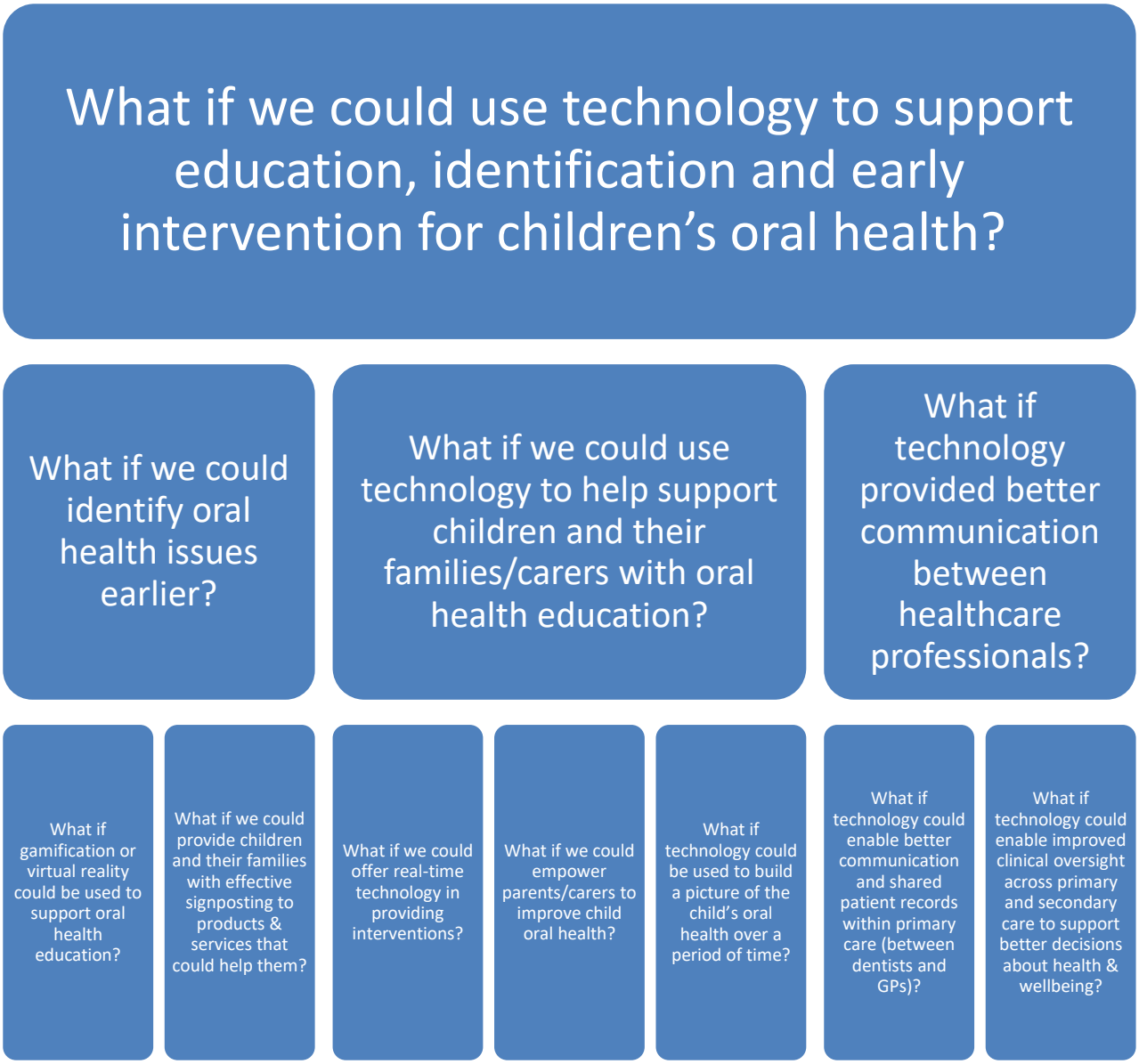
Conversely, dentists have a unique vantage point of local patient demographics: patients typically present to the dentist on a regular basis thus providing a consistent and ongoing opportunity to support regular monitoring of patients whilst they are non-symptomatic unlike many who typically present to the GP with a new or persisting problem[17] (Brocklehurst et al 2011). Studies have also shown the role of dentists in the monitoring and detection of systemic diseases such as diabetes and this has also been trialled in the US.[18]

The NHS has not invested in IT for dental practices to the same extent as for GPs, and as such most dentists are not all fully computerised and there are a multitude of different types of software which do not integrate with one another. One of the most significant issues faced by practitioners is the current lack of communication between GP and dental services and the ability to transfer any screening information collected. Therefore, innovative ways of communicating and collaborating within primary care is needed.

Additionally, communication between dental practices and secondary care for referral cases are often entirely analog in nature, relying on archaic systems of information transfer with much passing unidirectionally to secondary care with test results, imaging and treatment plans not made available to those primary care support networks.

Use of more diagnostic testing in primary dental care may also change the way general dental practice services and care are delivered, affecting the interaction with secondary care and requiring novel ways for information sharing.

The following “what if’s” are some examples of scenarios that have the potential to help meet unmet needs for our children’s oral health challenges. The statements are intended as examples only.



Category 2: Oral cancers – Triage, Diagnostics & Patient Outcomes

Background

Head and neck cancer is the 8th most common cancer in the UK, accounting for 3% of all new cancer cases and in males, head and neck cancer is the 4th most common cancer, with around 8,400 new cases in 2015. Each year there are approximately 11,700 new cases of head and neck cancer in the UK, equivalent to 32 every day (2013-2015). There are around 3,900 head and neck cancer deaths in the UK every year, equivalent to 11 every day (2014-2016). Mortality rates for oral cancer are projected to rise by 38% in the UK between 2014 and 2035, yet 46-88% of oral cavity and other head and neck cancer cases in the UK are preventable. [19]

The majority of oral cancers (45%) are detected at stage 4 and this late presentation may be attributed to a variety of reasons including patient presentation, appropriate recognition and referral and screening programmes available.[20] Furthermore, the incidence is anticipated to rise by 33% (between 2014 and 2035) and with the average age of patients being 70-74 along with an ageing population, it is likely to become an increasing presentation to those in primary care. Although survival is dependent on multiple factors those with stage 3-4 (men and women) have approximately a 50% chance of survival at 3 years[21,22,23].

According to NICE guidelines[24], for certain symptoms and suspected oral cancer, a GP should consider cross-referring a patient to a dentist. Yet only around half the UK population are registered with a dentist, or regularly attending check-ups. Furthermore, oral cancer rates are higher among people who don't have easy access to a dentist – particularly people from lower income groups. Consequently, both GPs *and* dentists have a role to play in referring people with signs of mouth cancer [25].

Initiatives such as the Oral Cancer Toolkit[26], developed by the British Dental Association and Cancer Research, have been developed to enable both GPs and dentists to identify and refer possible cases of oral cases.

Challenges

Getting the right diagnosis at the right time, as early as possible, is critical for improvements in patient care and enhancements in efficiency for the NHS: within cancer services, patients benefit from 2 week-wait pathways which enhance speed of delivery of care. In many instances, diseases affecting the oral cavity may be referred to secondary care for supplementary assessment and management by Oral and Maxillofacial Surgery and occasionally tertiary referral to Oral Medicine.

The challenges in primary care diagnostics are of course different to those in a pathology or central service facility, however in the case of diseases such as oral cancer, the ability to refer quickly with appropriate screening, or early investigations, may influence the eventual outcomes. Primary care requirements are focused around the consultation where results and actions will need to be delivered in a short time frame and furthermore many potentially premalignant lesions may require monitoring over protracted periods of time and this may not always take place in secondary care and rely on primary care.

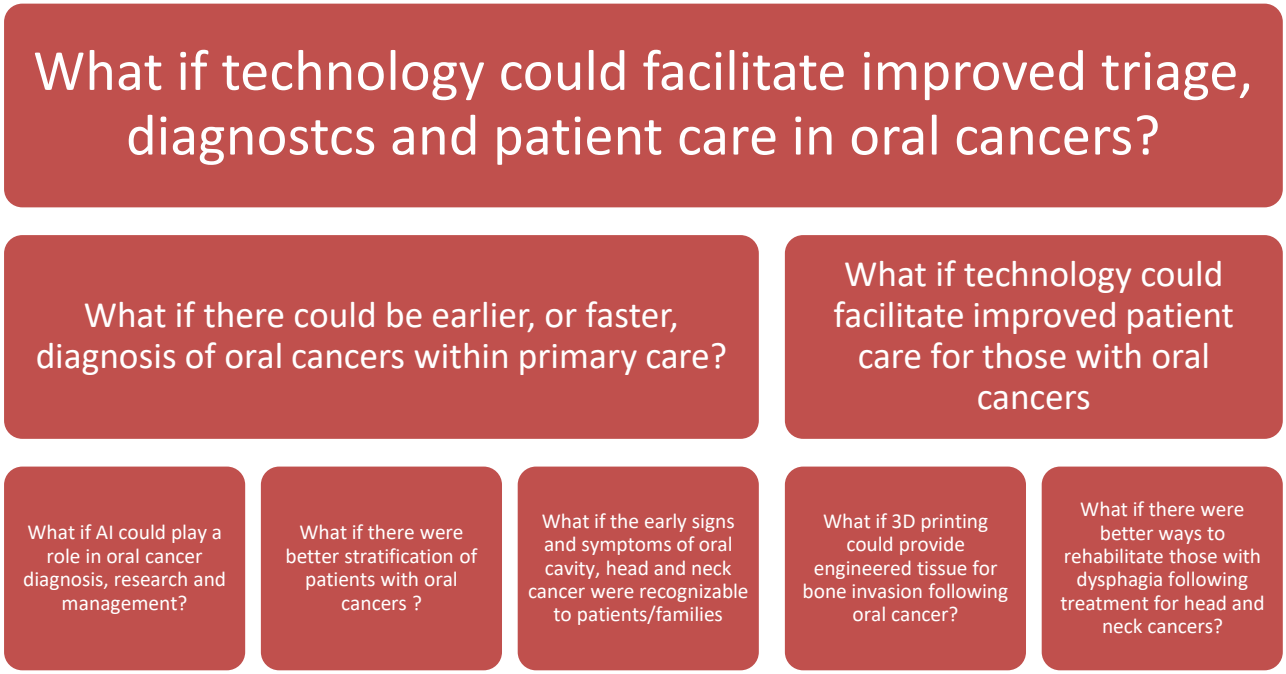
Many cancers are preceded by premalignant conditions, several of which have complex presentations and many of which may not be symptomatic[27]. Many of these conditions may be monitored over years by both general dental practitioners and specialist units alike and long-term outcomes on both transformation and management schemes are often in need of data.

While there are some point of care diagnostic technologies both in development and on the market, feedback from General Dental Practitioners and maxillofacial surgeons suggest many of these are not adequate with regards to accuracy. Furthermore, within the requirements of a busy and over stretched general dental practice service, a number of factors have to be considered:

- Many general dental practices may want to involve non-dental staff in providing a diagnostic service, although use of devices may require specialist skills or lengthy and/or complex training.
- Equipment and consumables may be too expensive, not portable enough and difficult to maintain.

- Both the initial cost and whole life cost (associated with consumables, servicing, training etc) may be prohibitive for many general dental practices to afford.
- Results may not be robust/reliable enough to confidently diagnose and triage patients without still relying heavily on referral to specialists in acute care for confirmation of diagnosis: responsibility for each diagnostic result and consultant lead care must not be compromised.

The following "what ifs" are some examples of scenarios that have the potential to improve diagnostics and patient outcomes for patients with oral cancers, they are in no way prescriptive or limiting. Applicants should think as broadly as possible; the following scenarios are intended as examples only:



Application process

This competition is part of the Small Business Research Initiative (SBRI) programme which aims to bring novel solutions to Government departments' issues by engaging with innovative companies that would not be reached in other ways:

- It enables Government departments and public sector agencies to procure new technologies faster and with managed risk;
- It provides vital funding for a critical stage of technology development through demonstration and trial – especially for early-stage companies.

The SBRI scheme is particularly suited to small and medium-sized businesses, as the contracts are of relatively small value and operate on short timescales for Government departments.

It is an opportunity for new companies to engage a public sector customer pre-procurement. The intellectual property rights are retained by the company, with certain rights of use retained by the NHS and Department of Health.

The competition is designed to show the technical feasibility of the proposed concept, and the development contracts placed will be for a maximum of 6 months and up to £100,000 (incl. VAT) per project.

The application process is managed on behalf of NHS England by the Eastern Academic Health Science Network through its delivery agent Health Enterprise East. All applications should be made using the application portal which can be accessed through the website www.sbrihealthcare.co.uk.

Briefing events for businesses interested in finding out more about these competitions will be held on 19th July in London. Please check the SBRI Healthcare Website for confirmation of dates and venues, information on how to register and details of the challenges that will be presented at each event.

Please complete your application using the online portal and submit all relevant forms by 1200hrs on the 22nd August 2018.

Key dates

Competition launch	9 July 2018
Briefing events	19 July, London
Deadline for applications	22 August 2018 (12:00)
Assessment	September / October 2018
Contracts awarded	November 2018
Feedback provided by	January 2019

More information

For more information on this competition, visit:
www.sbrihealthcare.co.uk

For any enquiries e-mail:
sbrienquiries@hee.co.uk

For more information about the SBRI programme, visit:
https://www.gov.uk/government/collections/sbri-the-small-business-research-initiative

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