

Safety and Efficacy of a New and Emerging Dental X-ray Modality

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Project partners

University of Manchester (UK), National and Kapodistrian University of Athens (Greece), "Iuliu Hategianu" University of Cluj-Napoca (Romania), Leeds Test Objects Ltd. (UK), Katholieke Universiteit Leuven (Belgium), Malmö University (Sweden), Vilnius University (Lithuania).

More about

SEDENTEXCT at:
www.sedentexct.eu



The Seventh Framework Programme of the European Atomic Energy Community (Euratom) for nuclear research and training activities (2007 to 2011)

Newsletter

Editorial

Welcome to this first six-monthly Newsletter for the SEDENTEXCT project. According to one Encyclopaedia, a "Newsletter" is "an informal publication, often simple in format and crisp in style, which provides special information, advice, opinions, and forecasts for a defined audience". You, the reader, will be the judge of whether this publication lives up to the stylistic elements of this definition. What we aim to do in this and subsequent editions is not merely to reproduce the contents of the project website (www.sedentexct.eu), but to inform you about how the project is progressing and evolving. One feature I intend to develop into a series is a "profiles" section, introducing the project team members to a wider audience. In the future, we will also try to focus on at least one aspect of the project in more detail.

SEDENTEXCT is, of course, a project aimed at improving the safety and efficacy of Cone Beam Computed Tomography (CBCT)

in dentistry. CBCT represents a dramatic shift in dental imaging. Although the technology of dental imaging improved steadily from the time the first dental radiographic image was taken in 1896, but without dramatic advances. Today, even with digital technology, an intraoral dental radiograph is a simple two-dimensional "shadow picture" that would be recognisable to the earliest dental radiographers. In the 1950s, dental and maxillofacial radiology saw its first revolutionary change with the development of panoramic radiography. In some ways, the current excitement in the dental world over CBCT echoes that which occurred when dental panoramic equipment was first marketed; it was seen as having almost universal application, everyone wanted it, new methods of quality assurance and safety testing had to be developed and clinicians were using equipment with little or no training. What subsequently happened with panoramic radiography was overuse, often driven by monetary factors. Efforts in devel-



oping standards for panoramic radiography (referral criteria, quality standards, dose limitation strategies, curricula for training) happened after equipment was already out "in the real world". We have learnt our lesson from panoramic radiography that standards for CBCT will need to be developed quickly and widely disseminated. I hope that SEDENTEXCT can play a valuable role in this respect.

If you have received this Newsletter by direct email, it is because SEDENTEXCT sees you as an important member of the community of professionals and lay people dealing with CBCT in dentistry. If you came across the Newsletter on our project website and would like to receive subsequent editions by direct mail, do not hesitate to contact me at keith.horner@manchester.ac.uk. In either case, I would welcome your views and input into the project. I hope you find this Newsletter interesting and informative.

Keith Horner

SEDENTEXCT Project Co-ordinator



The SEDENTEXCT project team at the "Kick off" meeting in Leuven in January 2008

SEDEXCT project objectives

- To develop evidence-based guidelines on use of CBCT in dentistry, including referral criteria, quality assurance guidelines and optimisation strategies.
- To determine the level of patient dose in dental CBCT, paying special attention to paediatric dosimetry, and personnel dose.
- To perform diagnostic accuracy studies for CBCT for key clinical applications in dentistry.
- To develop a quality assurance programme, including a tool/tools for quality assurance work (including a marketable quality assurance phantom) and to define exposure protocols for specific clinical applications.
- To measure cost-effectiveness of important clinical uses of CBCT compared with traditional methods.
- To conduct valorisation, including dissemination, activities via an 'open access' website.

Cone Beam CT and SEDEXCT highlighted at EADMFR Congress in Budapest



The objective of the European Academy of Dentomaxillofacial Radiology (EADMFR) is to promote, advance and improve clinical practice, education and/or research specifically related to the specialty of dental and maxillofacial radiology within Europe, and to provide a forum for discussion, communication and the professional advancement of its members. From June 25-28, the Academy met in Budapest for its 11th Congress, hosted by Dr. Levente Pataký (Chair of the Congress and President of the Dentomaxillofacial Radiological Section of the Hungarian Dental Association). The Academy is a community of those for whom Dentomaxillofacial Radiology is of special interest. As such it offered an excellent opportunity for informing this

community about SEDEXCT.

CBCT was a dominant presence at the Congress. The Pre-Congress course, co-chaired by Allan Farman (University of Louisville, USA) and Keith Horner (University of Manchester, UK and SEDEXCT Co-ordinator) set the tone of the conference with a series of presentations on CBCT by speakers from both sides of the Atlantic. The audience was treated to many examples of impressive imaging using the technique, but far more interesting was the divergence of views between the American presenters and those from Europe, with the latter favouring a more cautious and selective approach to CBCT use than the former. A round-table

discussion at the end of these presentations provided an opportunity for audience involvement and vigorous discussion.

The Congress proper began on the 26th June, with the usual format of oral presentations and posters. As can be seen from the abstracts of the Congress, CBCT was the recurring theme of the research being presented. In due course it is likely that we will see a large number of papers in the scientific literature that will make valuable contributions to Work Package 1 of the SEDEXCT project, dealing with evidence-based guideline development.

Outside the meeting rooms, an excellent trade exhibition was held, hosting almost all manufac-

turers of CBCT equipment. Congress participants were seen showing a lot of interest in new CBCT machines. For the SEDENTEXCT project, it afforded a great opportunity to make some contacts with manufacturers at a European level for input into Work Package 6 of the project.

On the final morning of the Congress, a special CBCT Debate was held in the main meeting room. This was chaired by Kostas Tsiklakis (President of EADMFR and SEDENTEXCT lead scientist for Athens University) and Eric Whaites (Immediate Past-President of EADMFR). This debate was stimulated by a perceived need for the specialists in Dentomaxillofacial Radiology to be seen to give a lead

in setting standards for CBCT use. In this respect the Debate was in synergy with SEDENTEXCT objectives and Prof. Keith Horner was pleased to present a summary of the project to the assembly. Following the initial presentations, the Debate moved on to consider draft "Basic Principles of CBCT use". These had been developed by the Congress chairmen and Prof. Horner, using as a template the recommendations for dental radiography devised as part of the 2004 "European Guidelines on Radiation Protection in Dental Radiology" (http://ec.europa.eu/energy/nuclear/radioprotection/publication/136_en.htm). Nine-

teen draft "principles" were presented, dealing with Justification, Optimisation and Training, and each was opened for debate. The audience, consisting not only of EADMFR members but also industry representatives from the Congress Exhibition, made useful suggestions for improvement and modification. The draft principles are currently being revised and will be presented to EADMFR members later in 2008 in an iterative process of consensus approval. These Principles will be incorporated into the results of the SEDENTEXCT project and we are delighted to have played a part in their development.



Kostas Tsiklakis and Eric Whaites chairing the EADMFR CBCT Debate on 28th June in Budapest

SEDEXCT at six months

The Newsletter for the SEDENTEXCT project, as described in our Communication Action Plan, is to heighten awareness of the project aims, progress and results. SEDENTEXCT started on 1 January 2008 and, as reported on our website, a "kick off" meeting was arranged in Leuven, Belgium for later that month. At that meeting, attended by European Commission representatives (see the "team" photograph on p.1 of this edition), we got off to a great start. Many of the project team know each other and have worked well together in the past. Those partners who are new to this kind of collaboration soon felt that they were amongst friends. Some early decisions were made

regarding the research and the management processes.

Since then substantial progress has been made and we held our six month progress meeting on June 24 in Budapest. This location was chosen to coincide with the 11th Congress of EADMFR (see previous story). The conjunction of the project meeting and a four-day Congress in intense summer heat meant that it was a long, hard week. Fortunately, our project meeting was held in the air-conditioned and well-equipped Hotel Mercure Buda.

After six months, the Project is really just getting underway and there have been only a few project milestones against which we

can assess our progress. It would be inappropriate to repeat here the specific objectives of each Work Package (WP) when these are fully explained on the project website, but here is a brief report on progress so far:

Work package 1 (<http://www.sedentext.eu/wp1>)

This WP deals with guideline development and the scientists involved are deep in the esoteric mysteries of the systematic review process. Search strategies have been defined and papers are being assembled for critical appraisal using standardised data collection proformas. At some point in the near future we plan to include the search outputs on the project



Some Project team members relax in Leuven, January 2008

website, as this would be a useful resource for many. At present, the WP team are intent on the aim of delivering provisional guidelines at the start of 2009.

Work package 2 (<http://www.sedentext.eu/wp2>)

The dosimetry work is well underway. Ruben Pauwels, a young scientist from Katholieke Universiteit Leuven and a key member of the team, presented some initial results for dosimetry of Scanora 3D, Picasso Trio and Promax 3D machines using adult ART phantoms. We hope to move on to paediatric dosimetry, an emphasis of SEDENTEXCT, in the autumn. Other news for this WP is that the Manchester partner has been fortunate to recruit Dr. Christy Theodorakou as Post-doc Research Assistant for the project. Christy has an impressive CV and, as a Greek working in the UK, is a fine example of European cooperation.

Work package 3 (<http://www.sedentext.eu/wp3>)

This WP is focused on quality assurance. The main focus of the first months of the project has been designing a first prototype quality assurance phantom. The team members met in February at Leeds Test Objects Ltd. Headquarters at Boroughbridge, near York, UK. Since then there has been some remarkable progress and this WP is well on target to deliver the first prototype phantom. As noted by Prof. Tsiklakis, the lead for this WP, the involve-

ment and work of the SME partner Leeds Test Objects Ltd has been fantastic.

Work package 4 (<http://www.sedentext.eu/wp4>)

This WP is focused on diagnostic accuracy. As such it stands out from the others as having ethical issues. The two centres carrying most of this responsibility (Leuven and Cluj-Napoca) confirmed that ethical approvals have been obtained and the slow, hard work of patient recruitment is now underway. At the Budapest meeting, fine points of the protocol for image assessment and analysis of future results were discussed. An impressive array of CBCT equipment is available for comparative studies in the *in vitro* work included in this WP.

Work package 5 (<http://www.sedentext.eu/wp5>)

This WP is all about cost-effectiveness and is led from Malmö University (Christina Lindh and Madeleine Rohlin), with specialist Health Economics input from Prof. Stephen Birch at Manchester University. Christina and Stephen met in May to discuss fine details of the economic evaluation procedures. The WP objectives have been adjusted and a decision made to focus on one specific application of CBCT in order that a model for economic evaluation can be perfected and then applied to other CBCT uses later in the project.

Work package 6 (<http://www.sedentext.eu/wp6>)

www.sedentext.eu/wp6)

This is the most externally visible part of the project, as it revolves around the website. We have faced a few challenges in Manchester with the WP, as Jim Petch, the original lead for the WP, unexpectedly took early retirement shortly after the project start date. We wish Jim well for the future. Fortunately one of his team, Mohammed Islam, has done sterling work maintaining the website, leaving Hugh Devlin ("Dental Lead" for WP6) to manage the research element. We are all set to conduct the Needs Analysis of stakeholders for training in CBCT, which will dictate the website content. If you are reading this and are not a member of EADMFR or have not already been contacted as a "stakeholder", please email hugh.devlin@manchester.ac.uk so that you can contribute to this stage of the project.

SEDENTEXCT Project manager appointed



Gillian Armitt joins the SEDENTEXCT project as project manager on 4 August, working the equivalent of two days a

week. She will spread her time across the week according to the needs of the project – so you will be able to contact her whenever you need to. She is currently project manager for a UK-funded e-learning project (ending shortly), as well as being Manchester Medical School's local project manager for the Framework 7 Language Technologies for Lifelong Learning (LTfLL) project. Originally a researcher in biochemistry, her career has included periods as project

manager in university administration and as information manager for an international marine insurance company. Gillian says *"I am very much looking forward to joining the SEDENTEXCT project and will be in touch when I start, to learn from you how I can best support you"*.

Gillian's email address is: gillian.armitt@manchester.ac.uk

Profile: young scientists from Leuven in SEDENTEXCT

One of the great joys of conducting research is to see the opportunities it allows to develop the careers of young scientists.

In this edition of the Newsletter, we focus on two young scientists from Leuven.

Ruben Pauwels



Ruben is a PhD student from the Catholic University of Leuven (Belgium) who will be taking part in WP 2 (dosimetry) and WP 3 (optimisation). Having studied Biomedical Sciences followed by a Master of Medical Imaging, he has worked on CBCT for two years.

Ruben says *"With this project I will have the opportunity to work with a fantastic team of researchers and gain many experiences, forming the basis for my future career"*

Olivia Nackaerts

Olivia Nackaerts obtained her master degree in Speech Therapy and Audiology Sciences in 2000. Her thesis dealt with articulation and myofunction in edentulous patients. Before returning to dentistry, she obtained a degree in Media and Information Sciences in 2001. After a further two years assisting in Congress Organisation, she started working at the Oral Imaging Center, K.U.Leuven in 2003. She was involved in the Osteodent project (5th EC Framework Programme) and started her PhD training, which is currently being finalised. Olivia says: *"I will be working on Work Package 4, diagnostic accuracy. Also, I will coordinate the contributions of Leuven*

in the other workpackages. My research enthusiasm arose while working on my master thesis, linking speech therapy and dentistry. During the Osteodent project, I saw the great potential in improving the quality of research through regular conferring between centres. This experience strengthened my keenness on continuing along the science path.



SEDENTEXCT creates a motivating challenge, because of the diversity of the workpackages in which we are involved. I look forward to guiding new researchers, and hope for a continuing European cooperation".



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<http://cordis.europa.eu/fp7/euratom/> .



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