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SENTINEL. TRAINING SESSION
Madrid, 21-22 April 2006

SENTINEL
A Europan Coordination Action

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SENTINEL
(European Coordination Action)

- **SENTINEL = Safety and Efficacy for New Techniques and Imaging using New Equipment to Support European Legislation (2005-2007).**

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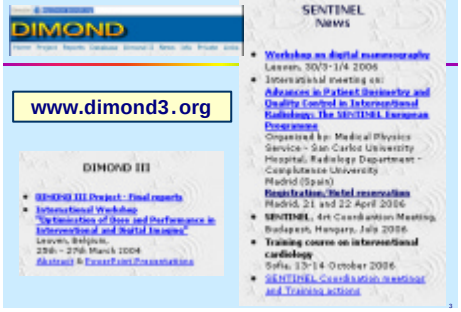

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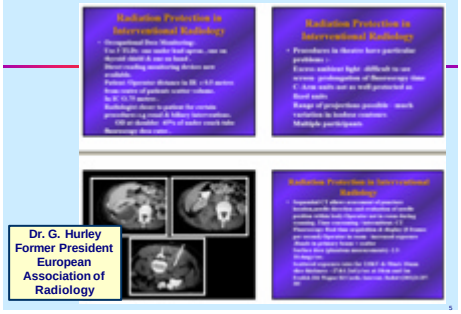

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Expert approach to new safety challenges

- The main objectives of this coordination action relate to new digital radiology equipment being introduced by medical institutions in Europe.
- The project will establish both clinical and physical image quality criteria, and the link between the two, perform a series of dosimetry studies and develop good practice guidelines for radiation protection and training material.

Expert approach to new safety challenges

- These actions will address international standardisation issues, evaluate ethical issues in radiation protection, and develop resources and harmonised approaches to radiation protection training for high dose procedures.
- The research group comprises clinical partners and medical physicists working in hospitals, industry and universities, and government scientists. The consortium has close links to industry and national/international professional societies.

Quality assessment for digital guidelines

- The research will establish reference dose levels for new detectors used in digital radiology, cardiology and interventional radiology, and develop image quality criteria (including digital mammography).
- The group will derive a consensus on the acceptance, status and consistency test protocols for cardiology and interventional radiology, and develop approaches to undertaking national patient dose surveys.

SENTINEL details

- SENTINEL is a consortium of 22 research teams from 20 different European countries, and the EFOMP.
- Identified as Project/Contract no.: FP6 – 012909 – SENTINEL.
- SENTINEL project commences on 1st February 2005 for 27 months (until end April 2007).

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SENTINEL partners

- Austria
- Belgium
- Bulgaria
- Cyprus
- EFOMP
- Estonia
- Finland
- Germany
- Greece
- Hungary
- Ireland
- Ireland
- Italy
- Luxembourg
- Netherlands
- Poland
- Romania
- Slovakia
- Slovenia
- Spain
- Turkey
- UK

SENTINEL partners

No.	Organisation name	Country
1	QARC, Newcastle	UK
2	Haughton Institute, Dublin	IR
3	Krankenhaus der Barmherzigen Bruder, Trier	D
4	Azienda Ospedaliera S. Maria Della Misericordia	I
5	Complutense University, Madrid	ES
6	Katholieke Universiteit, Leuven	BE
7	Innsbruk Medical University, Department of Radiology	AU
8	Radiation Protection Department, Ministry of Health, Luxembourg	LU
9	STUK – Radiation and Nuclear Safety Authority	FIN
10	Delft University of Technology, Netherlands	NL
11	The National and Kapodistrian University of Athens	GR

SENTINEL partners

No.	Organisation name	Country
12	Nofer Institute of Occupational Medicine, Radiation Protection Department, Lodz	PO
13	Biomedical Research Foundation, Nicosia	CY
14	MEDICONTROL, Vrbove	SK
15	Tartu Uelikool	EE
16	Institute of Occupational Safety, Slovenia	SI
17	Ankara University, Faculty of Engineering	TR
18	Physics Department, University of Pisa	I
19	National Centre of Radiobiology and Radiation Protection, Sofia	BG
20	National Research Institute for Radiobiology and Radiohygiene / Budapest	HU
21	NHS Lanarkshire Health Board, Scotland	UK
22	Institute of Public Health, Bucharest	RO

SENTINEL workpackages

1. Functional performance and standards for radiological equipment. Delf. Partner 10.
2. Efficacy and safety in digital radiology, dentistry, and nuclear medicine. Trier. P3.
3. Efficacy and safety in Cardiology. Udine P4.
4. Efficacy and safety in high individual dose procedures. Madrid. P5.
5. Efficacy and safety in population screening and imaging of sensitive groups. Leuven. P6.
6. Ethical, justification and related issues. P2. Dublin.
7. Good practice guidance and training. Newcastle. P1

Safety and Efficacy for New Techniques and Imaging
Using New Equipment to Support European Legislation

Contract No: FP6 - 012909

Coordination Action

CONSORTIUM AGREEMENT

This AGREEMENT is made on February 1, 2005

SENTINEL WP4. Efficacy and safety in IR

OBJECTIVES

1. Identification of examinations and practice in existing/new member states
2. Collation and standardisation of protocols and results for patient and staff dosimetry
3. Consensus on image quality/dose and standardisation of high dose radiology

SENTINEL WP4. Efficacy and safety in IR

OBJECTIVES – ADVANCES

1. Identification of examinations and practice in existing/new member states.
   - Done in Spain. Some other data received. Waiting for other partners.
2. Collation and standardisation of protocols and results for patient and staff dosimetry.
   - Done protocols. Working on data.
3. Consensus on image quality/dose and standardisation of high dose radiology.
   - To be done at the end of the project.

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SENTINEL WP4. Efficacy and safety in IR

Description of work

1. Collation of a series of equipment performance tests on new digital systems
2. Collation of information from a series of dosimetry studies
3. Consensus on the use of the DICOM header for information on patient dosimetry and quality control

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SENTINEL WP4. Efficacy and safety in IR

Deliverables

1. Techniques, practices and optimisation in interventional radiology in existing and new member states: review and collation of data.
2. Patient and staff dosimetry and their standardization in interventional radiology: review and collation of data.

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Deliverable		Lead	Participants 5 = Madrid 9 = Finland	Delivery date	Nature	Dissemin
Techniques, practices, equipment and optimisation in interventional radiology				24	R	RE
4.1.1	Identification of practice	5	All	12	R	RE
4.1.2	Collation of survey data	5	All	12	R	P
4.1.3	Consensus on DICOM	5	1, 2, 4, 6, 8, 11, 14, 16, 17	24	O	RE
4.1.4	Consensus on optimisation protocol	5	6, 8, 16, 17, 19, 21, 22(?)	24	R	PU

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Deliverable		Lead	Participants 5 = Madrid 9 = Finland	Deliv date	Nature	Dissemin
Patient and staff dosimetry in interventional radiology				24	R	PU
4.2.1	Patient dose protocol new detectors	9	1, 2, 3, 4, 9, 12, 14, 23	12	R	PU
4.2.2	Patient dose survey: interventional	9	1, 2, 3, 4, 6,7, 9, 11, 12, 14, 15, 17,19, 21, 22, 23	18	R	PU
4.2.3	National dose protocol	9	1, 2, 3, 4, 6, 7, 9, 12, 14, 17, 19, 21, 22, 23	18	R	PU
4.2.4	Staff dose collation	5	All	18	O	PU
4.2.5	Skin dose studies	5	4, 7, 9, 12, 13, 14, 17, 21, 22	24	R	PU
4.2.6	Standardisation of occupational studies	5	All	24	R	PU

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IEC and DICOM working together

- **IEC is working on a standard (drafted with the name "DICOM-DOSE") written in concert with DICOM WG 02 (IEC convenor: S. Balter).**
- **It is proposed that an "irradiation object" be stored for each irradiation event, irrespective of the storage of the images produced by that irradiation. The irradiation objects, along with other information, shall be stored in a "Radiation Dose Structured Report" (RDSR).**
- **The RDSR could be archived in the RIS, or PACS, or perhaps to be transferred to a "Radiation Safety Reporting System" (RSRS).**

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IEC and DICOM working together

- At present, the scope of DICOM DOSE is limited to aspects of projection radiography and fluoroscopy. Expansion of DICOM DOSE to all digital X-ray imaging modalities is planned.
- Working drafts prepared by IEC 62B MT38 defined the data fields found in irradiation objects and irradiation events. All of these elements are 'public fields' in the DICOM sense. Imaging Equipment complying with this document is only required to provide data for only those fields for which it is equipped.

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IEC and DICOM working together

- Four levels of conformance are foreseen:
  - Level 0 Limited Conformance: Equipment not conforming to a higher level but capable of generating a RDSR with some information.
  - Level 1 Limited Dose Monitoring: Equipment where the maximum skin dose for any examination (study) is less than 1.0 Gy for all normal uses.
  - Level 2 General Dose Monitoring: Equipment where the maximum skin dose for any examination (study) may exceed 1.0 Gy for any normal use.
  - Level 3 Advanced Dose Monitoring: Equipment where the maximum skin dose for any examination (study) may exceed 4.0 Gy for any normal use.

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