

SENTINEL Its Impact on Radiation Protection



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23 Partners
17 member states
3 accession states
IAEA



UNSCEAR Surveys Trend in Examination Frequency

| Year | Frequency/year |
|------|----------------|
| 1988 | 280 |
| 1993 | 300 |
| 2000 | 330 |

UNSCEAR Surveys Trend in Per Caput Dose

| Year | Dose (mSv) |
|------|------------|
| 1988 | 0.35 |
| 1993 | 0.3 |
| 2000 | 0.4 |

European Union



- X-rays were discovered over 100 years ago
- Radiation risks from medical exposures soon became apparent
- First attempts to regulate medical exposures in Europe started with the 1984 directive

European Union



- Health care equates to 8.4% of GDP
- Radiology is 10% of revenue expenditure
- Radiology equipment is 15% of capital expenditure
- In the UK this equates to 15,000,000,000 euros

SENTINEL European Union



- Population 457,000,000
- 180,000,000 radiology examinations per year
- Population exposure 220,000 man Sv

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- 90% of all patient examinations
- 60% of collective dose
- 50% of man-made sources of radiation

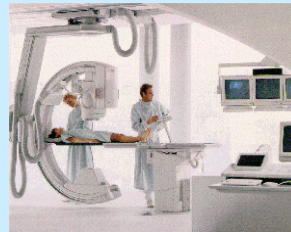
SENTINEL European Union



- Public concern about radiation in general
- Public want safe X-ray examinations
- Are all examinations justified

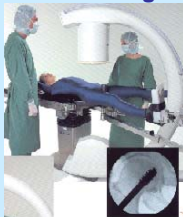
Technology Driven Revolution in Radiology

Introduction of new technology and imaging devices in radiology and nuclear medicine



Technology Driven Revolution in Radiology

Widespread application of computing techniques to enhance and extract information from images



European Dimension

- Support industry
- Develop new techniques
- Support Directives



Main Objectives

- Address efficacy and safety issues in all digital diagnostic examinations and nuclear medicine
- Particular emphasis on high dose procedures and sensitive groups



Objectives

- Establish physical and clinical image quality criteria and link the two
- Establish reference levels for new procedures, particularly for interventional radiology and cardiology



Objectives

- Develop good practice guidelines for new digital imaging equipment and procedures
- Develop training courses and supporting material



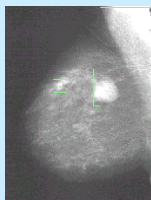
Justification and Optimisation

Needed to ensure that these imaging devices and clinical techniques are effective and safe



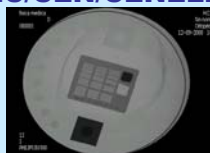
Justification and Optimisation

Emphasis on population screening and doses to sensitive groups



Functional Performance and Standards

- Investigate image quality indices and referral criteria
- Equipment performance surveys
- IEC/CEN/CENELEC



Efficacy and Safety

- Develop functional performance standards
- Patient dose surveys
- Optimisation studies



Efficacy and Safety in Cardiology

- Refine on-line dosimetry
- Take into account complexity
- Develop reference values



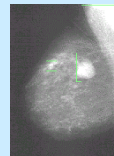
Efficacy and Safety in Interventional Radiology

- Methods for dose assessment
- Patient dose survey protocols
- DICOM header dosimetry data



Efficacy and Safety in Mammography Screening

- Digital mammography
- Risk/benefit studies
- Tissue sampling techniques



Ethical Issues



- Consider ethical issues in radiation protection
- Informed consent implies that the public are aware of dose levels for medical procedures
- Specific issues (e.g. pregnancy)

Training Guidelines

- Training needs identified
- Training syllabus developed
- Dissemination to member states



Summary



- **Safer, more effective procedures and examinations using new technology**
- **Greater public acceptance of medical uses of radiation**
- **Safer, more cost effective health care**