Romania national legal provisions on medical exposure and local experience in the Institute of Oncology “Ion Chiricuță” Cluj-Napoca

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Romania national legal provisions on medical exposure and local experience in IOCN

- evaluate the national legislation in the general domain of nuclear activity regulation, authorization and control in Romania

- local measures of reducing medical exposure in radiotherapy at the Institute of Oncology “Prof. Dr. Ion Chiricuță” Cluj-Napoca (IOCN)
Romania national legal provisions on medical exposure

Romania 111/1996 law
- the competent national authority for ionizing radiation medical exposure is the National Committee for Nuclear Activity Control (CNCAN)

- government agency founded in 1961
- 1972 Nuclear Agreement with IAEA (INFCIRC 180)
- 1998 independent agency

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• Norms in Radiological Security (NSR) 2000 - 2005
  → Fundamental Norms of Radiological Security (NSR-01)
  → Norms regarding Radioprotection in Medical Exposure (NSR-04)
  → Norms of Individual Dosimetry (NSR-06)
  → Norms of Radiological Security in Radioterapy Practice (NSR-12)
  → Norms for Individual Protection Equipment to ionizing radiation (NSR-15)

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Romania national legal provisions on medical exposure

- Norms of Radiological Security in Radioterapy Practice (NSR-12)
  - radiological security culture for each radiotherapy unit
  - radiological security policy stated by the authorization holder (top management)
  - establish a radioprotection programme
  - establish a quality management programme (ISO-9000)

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- Quality Management in Medical Exposure
  - specific procedures regarding radioprotection
  - dose constraints (patients/relatives/visitors)
  - investigational proceedings for accidental medical exposures
    → dose estimation
    → corrective & preventive measures
    → reporting to Health Ministry & CNCAN in 10 days
    → informing the patient and his physician (GP)
Local experience in the Institute of Oncology “Ion Chiricuță” Cluj-Napoca

- IOCN is a comprehensive cancer center in the NW region (1929)
  - OECI member since 2007
  - integrated management system (QMS ISO 9001:2008)
  - very high patient addressability & diverse pathology

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Local experience in the Institute of Oncology “Ion Chiricuță” Cluj-Napoca

- Radiotherapy & Brachytherapy dept.
  - radiation protection expert (physicist) certified by CNCAN
  - radiation protection committee
  - specific radiation protection programme
  - quality management programme
  - individual dose is monitored for all staff
  - QA procedures (beam data)
  - regular QC of the system and documentation
Local experience in the Institute of Oncology “Ion Chiricuță” Cluj-Napoca

• Specific quality control procedures for linac

<table>
<thead>
<tr>
<th>frequency</th>
<th>functional parameter check</th>
<th>action level</th>
</tr>
</thead>
</table>
| daily (7)  | 1. dose rate foton & electron beam  
2. door blocking system  
3. radiation warning monitor  
4. audio-video system  
5. lasers  
6. distance indicator | 3% functional  
2 mm                                                |
| monthly (20) | 1. dose parameters constancy in central beam axis  
2. beam homogeneity constancy  
3. gantry & collimator indicator  
4. radiation field vs. light field overlap  
5. field dimension indicator | 2%  
1 drg  
2 mm/ 1% per side  
2 mm |
| yearly (20) | 1. dose rate dependence with field dimension  
2. transmission factor constancy for standard accessories  
3. collimator rotation isocenter  
4. vertical table displacement | 2%  
2 mm Ø  
2 mm |
Local experience in the Institute of Oncology “Ion Chiricuță” Cluj-Napoca

• History of TLD intercomparison with IAEA for beam calibration

<table>
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<th>Date</th>
<th>Machine</th>
<th>Relative deviation (%)</th>
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<td>Varian iX_16X</td>
<td>1.3</td>
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Local experience in the Institute of Oncology “Ion Chiricuță” Cluj-Napoca

- 8 – 12 November 2010

IAEA QUATTRO AUDIT MISSION (RER6020/08/01)

- first hospital in Romania which underwent an IAEA audit

→ IOCN has the potential to become a Centre of Competence serving as a regional model if the recommendations given are followed and executed in the next period
Local experience in the Institute of Oncology “Ion Chiricuță” Cluj-Napoca

• QUATTRO AUDIT recommendations
  → number of staff (physicists & RTT’s) should be increased
  → further development of QMS & QA procedures
  → in-vivo dosimetry for all patients
  → provision should be made by the management so that an efficient incident reporting system is put in place
Local experience in the Institute of Oncology “Ion Chiricuță” Cluj-Napoca

- QUATTRO AUDIT recommendations to the Government
  → 30% of all cancer patients are receiving radiotherapy (50-60%)
  → well structures programmes for the clinical training of medical physicists are missing
  → the Romanian Government is encouraged to engage in the development of a national plan to upgrade the radiotherapy, including equipment and personnel, in order to achieve and maintain a sustainable national cancer programme.

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