



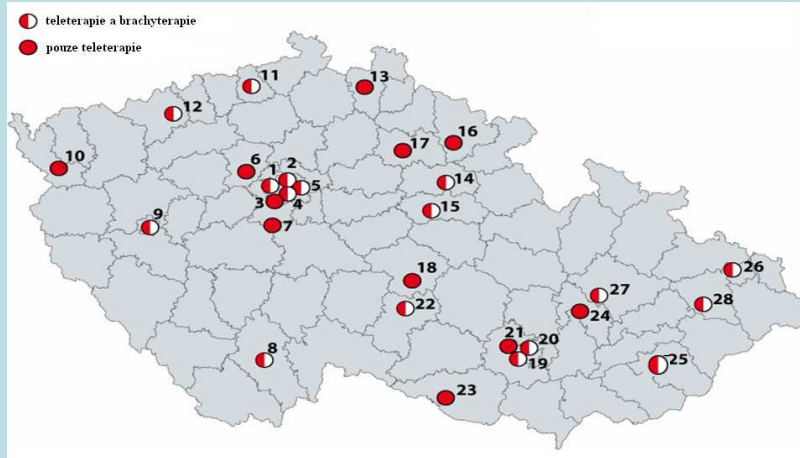
Preventing Accidents and Incidents in Radiotherapy in the Czech Republic

International Conference on Radiation
Protection in Medicine, Varna, 1 -3
IX.2010

Barbora Havrankova, Karla Petrova
The State Office for Nuclear Safety



General information



Radiotherapy machines in CZ

38	Linear Accelerators
----	---------------------

1	CyberKnife
---	------------

12	Cobalt Irradiators
----	--------------------

1	GammaKnife
---	------------

7	Cesium Irradiators
---	--------------------

25	X Ray Radiotherapy
----	--------------------

17	Brachytherapy
----	---------------

Documentation required by the Atomic Act:

- Quality Assurance Program
- In site Emergency Plan
- Monitoring Program
- Controlled Area delineation
- Optimalization

Radiotherapy departments in CZ

17	Complex Oncology centre
----	-------------------------

21	Radiotherapy
----	--------------



Accidents in the Radiotherapy

Accidents are described in the **Quality Assurance Program** (in clinical part is specified accidents according patient's pathway during treatment in particular, in quality assurance and control part is specified accidents according equipments failure).

Classification of Accidents:

- A „Radiation serious event“ – exp: Dose > 30% than planning dose

Reaction: notification to organization and SÚJB, immediate remedy, investigate, system measure, protocol to SÚJB.

- B “Radiation event with major sequel” – exp: Dose > 15% than planning dose

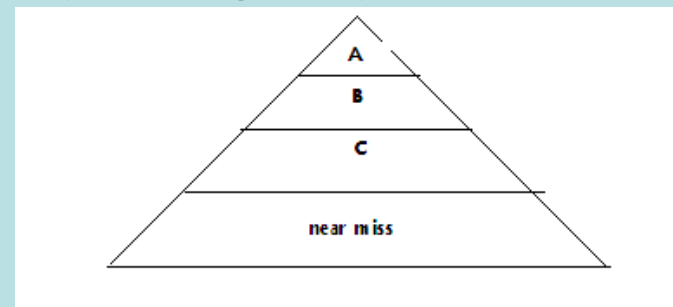
Reaction: notification to organization, immediate remedy, investigate, system measure, protocol.

- C “Radiation event with limited sequel” – exp: Patient was irradiated by bad wedge for the one time.

Reaction: notification to organization, immediate remedy, investigate, system measure, protocol

- D „Potential radiation event – Near miss”

Reaction: investigation system measure, register





Prevent Accidents in the Radiotherapy

Clear and instructive Quality Assurance Program including:

- Definition of responsibility for each members of the staff
- Cooperation between staff in hole of treatment process
- Methods of patient's identification in hole of treatment process
- Methods of marking irradiation field
- Using individual tools which are clearly identify
- Definition and controlling important points
- Double checking of every procedures during treatment process
- Definition every possibility of dissonances
- Quality assurance and quality control and double checking of results
- Definition of instruction in case of Accidents
- Reparations and Services



Responds in case of Accident

Clear and instructive Quality Assurance Program including:

- Identification of root causes
- Ingestion of corrective actions
- Write down the protocol about Accidence



Feedback in case of Accidents

Clear and instructive Quality Assurance Program including:

- Inform staff about identification of root causes and Ingestion of corrective Actions
- Controlling process where been the failures
- Incorporate finding into relevant documentation and plan of drills and training



Statistics: Accidents during 2005 - 2009

23 Radiotherapy departments – 162 Accidents

Accidents „A“ – 7 events

Accidents „B“ – 6 events

Accidents „C“ – 144 events

Accidents „D“ – 6 events

Root causes of Accidents – types of failures:

Human factor – 141 cases

(5%diagnostic, treatment prescription and acceptance, 20%simulation,
treatment planning and patient set- up, 75% treatment)

Failures of equipments – 21 cases



Incidents in the Radiotherapy

Clear and instructive **In- site Emergency Plan:**

- Definition of responsibility for each members of the staff in case of Incident
- Cooperation between staff in the Incident
- Definition and controlling important points
- Definition every possibility of potential event
- Quality assurance and quality control and double checking of results
- Definition of instruction in case of Incident
- Identification reasons of Incident
- Ingestion of corrective Actions
- Write down the protocol about Incidents
- Incorporate finding into relevant documentation and plan of drills and training



Inspections

- Special Inspection Team for Radiotherapy
- Inspection directing clinical part (controlling preparedness to radiological accident and incident – documentations, instructions and analyses of accidents and incidents)
- Inspection directing quality assurance and control (on- side visit during calibration, dosimetry, acceptance tests and commissioning measurements and independent audits)
- We control documentation about Reparations and Services in both type of inspection



Important points

- Definition of all predicted possibilities for accident and incidents in radiotherapy department
- Rules for examination of events
- Proposed the remedial action
- Definition of responsibilities within the workplace
- Feedback from solving of accident and incidents elsewhere
- Regular practicing e and drills of potential possibilities of accident and incidents
- Regular update of Quality assurance program
- Training of “In-site emergency plan”
- Reciprocal exchange of information between license holders and regulatory body
- Regular Inspections