Risk assessment methods are one of the elements of the implementation new technologies in radiation therapy

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The bases of safety in radiotherapy:

1) "prospective methods"
   - regulations

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     the safe use of ionizing radiation for all types of medical exposure

   - standards
     a list of procedures that ensure uniformity of the radiotherapy procedures and theirs realization
The bases of safety in radiotherapy:

- "Good professional practice":
  - in the field of dosimetry

- in treatment planning and treatment delivery
The bases of safety in radiotherapy:

2) "reactive methods”

Knowledge gained from accident’s reports allows us to assess whether the available technology and the level of training the staff prepared the radiotherapy center to avoid a similar situation
The bases of safety in radiotherapy:

- Limitations of both methods; 1) and 2):
  - the lack of answers: "what else is a hazard?",
  - both methods focus on events with serious consequences and a low probability of occurrence.
- Therefore, it is necessary to identify all potential sources of hazards in the radiotherapy process - risk assessment - to identify potential errors from the side of:
  **machine, methods, materials or man**
  that can generate identifiable and undesirable consequences.
- Assessment is done by providing:
  severity, occurrence, the difficulty of detection, probability and frequency of each action/function in the reporting radiotherapy process.
The aim

- to provide a risk assessment during the implementation of new technologies in the radiotherapy center – Greater Poland Cancer Centre;
- the new technology – the new radiotherapy process – CyberKnife (Accuray, Sunnyvale, USA).

**The aim of risk assessment:**

- identify and evaluate potential errors/risks that may arise during implementation new radiotherapy process and determine consequences of their occurrence,
- identify actions that could eliminate them or at least reduce the possibility of appearance potential errors/risks,
- mapping and document all actions of the new radiotherapy process.
Radiotherapy system– CyberKnife VSI
Risk assessment method - FMEA

FMEA – Failure Mode and Effects Analysis

- Outcomes of the FMEA method → actual or potential errors/risks or problems.
- Identifies → the causes of errors/risks or problems:
  - severity S,
  - occurrence O,
  - detection D.
- The effects → reduce errors/hazards or problems.
- Resultant parameter → expressed by the number of RPN - Risk Priority Number), scales risk priorities of the process/functions between 1-1000.
- The final result of the FMEA → Follow-up errors/problems and determine corrective actions.
Result – FMEA of the CK radiotherapy process

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The RPN for the actions during the implementation of the CK process
Conclusion

- Risk assessment method is needed during implementation new technology – CyberKnife – in the radiotherapy center.

- FMAE gave the possibility to identify all the 37th actions during the implementation new radiotherapy process and also the probability of errors and their causes. Determine detection and the frequency of the error for each function/action which was performed during implementation analyzed process.

- Risk assessment allows us to focus on the most important hazard’s actions and eliminate them. Finally provide proper safety during the process of implementing new technology.

- The final effect – the controlled risk.
Dziękuję za uwagę

Thank you for your attention