

# Performing a risk analysis of processes in the radiation oncology department



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## Performing a risk analysis of processes in the radiation oncology department

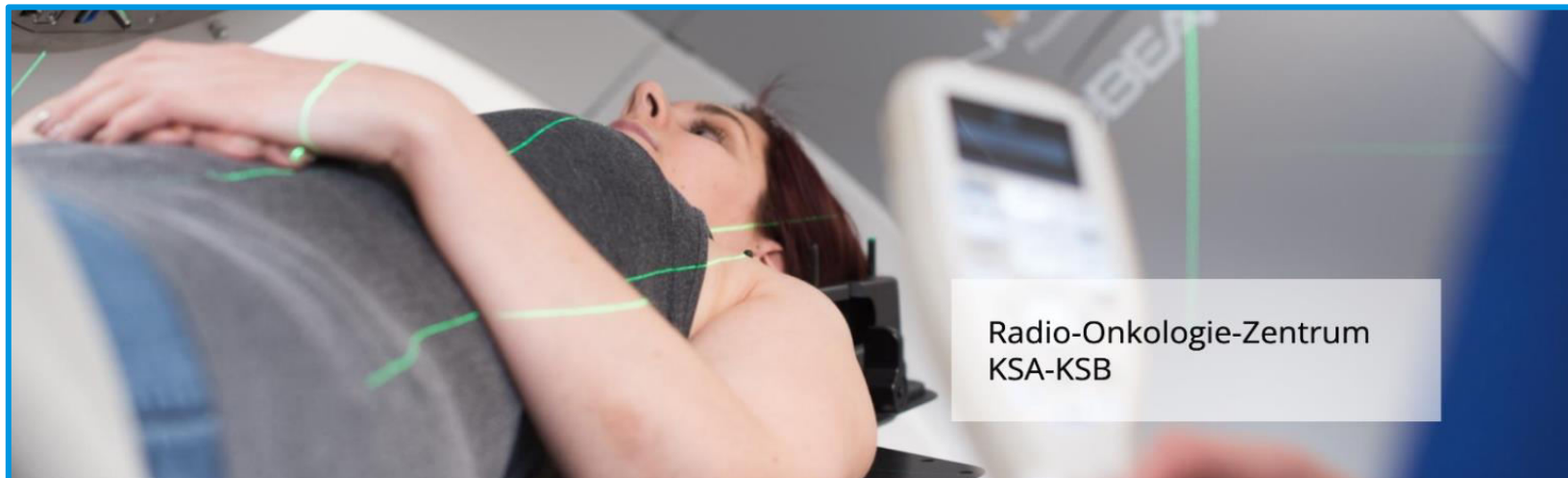


“Radiotherapy is widely known to be one of the safest areas of modern medicine, yet, for some, this essential treatment can bring harm, personal tragedy and even death”

Source: Radiotherapy Risk Profile WHO/IER/PSP/2008.12

## Background and Aim

- Structured annual risk analysis required
- Implement tool to identify vulnerabilities
- Evaluate as many clinically relevant processes
- Outcome: improve quality of radiotherapy treatment and patient safety





## Method: HFMEA 'light version'

### The Healthcare Failure Mode And Effect Analysis method (HFMEA)

- Multiple time-intensive brainstorm meetings with full team

**Disadvantage:** Extremely time-consuming

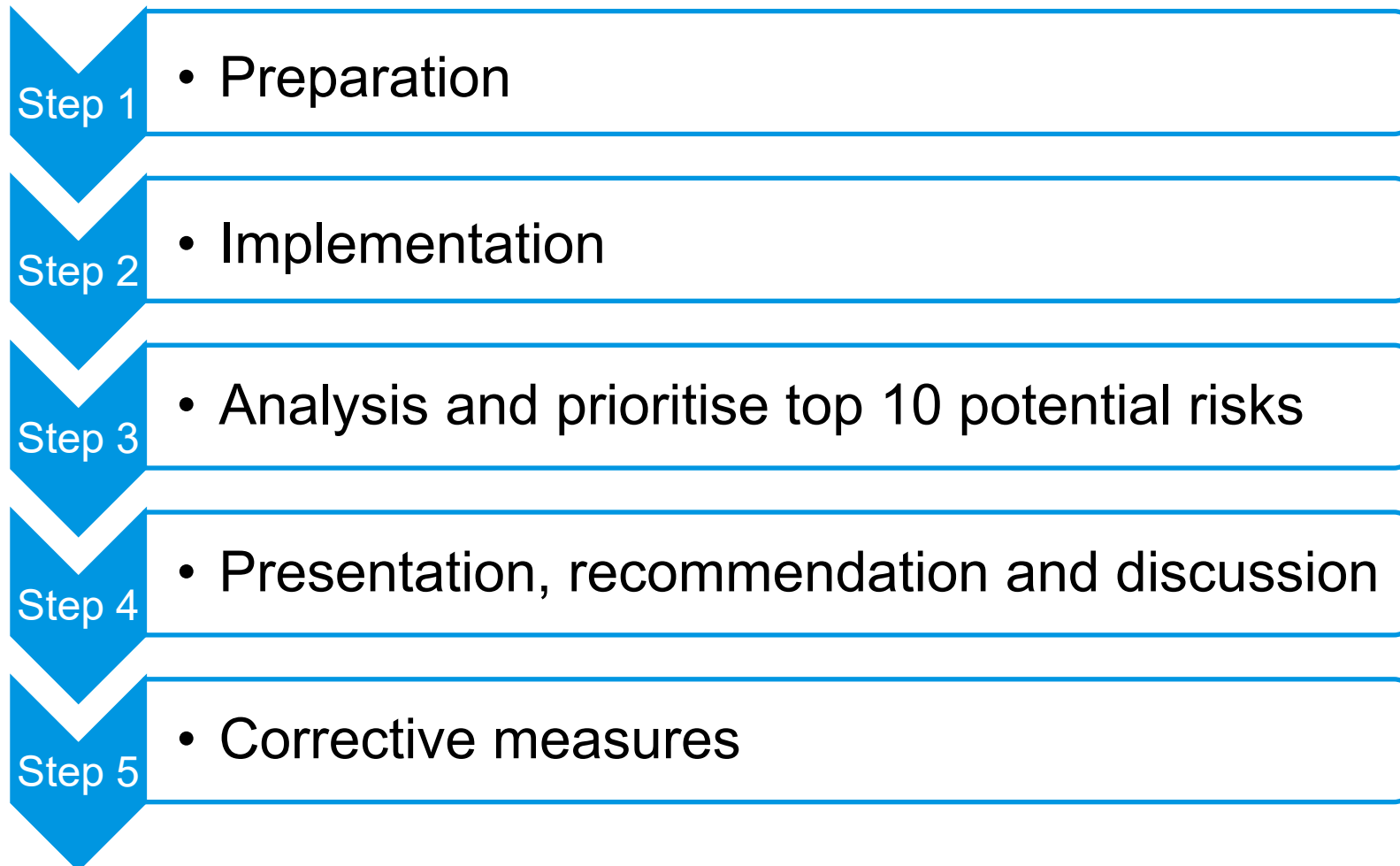
### HFMEA 'light version'

- Focusses on the highest risks

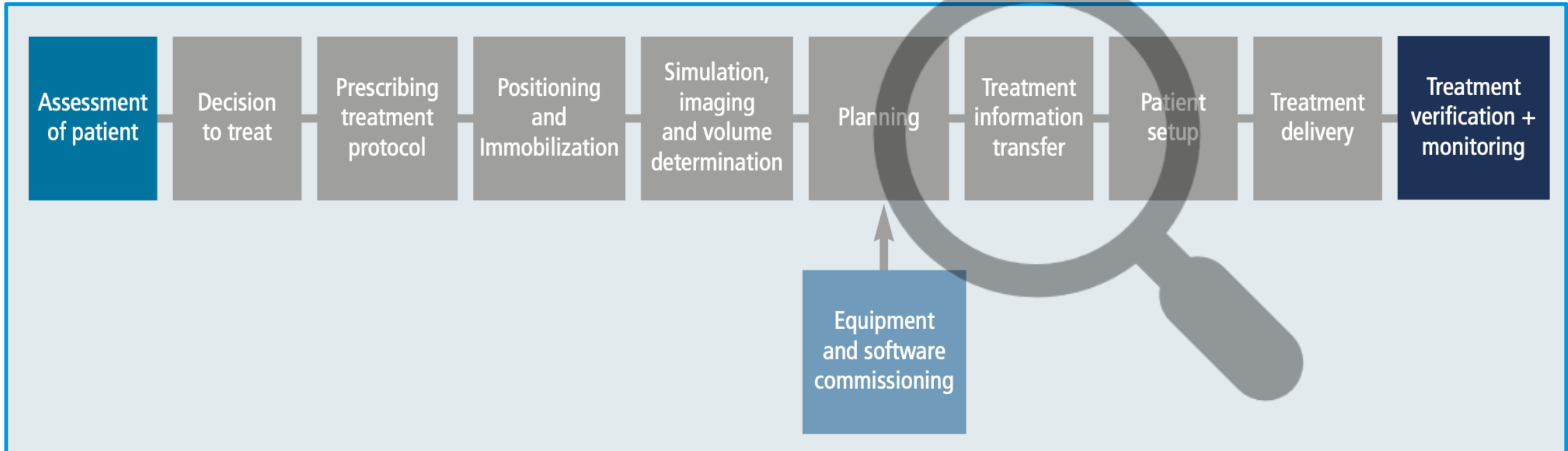
**Main advantage:** Less work, work independently and daily operations can go on

## Method: HFMEA 'light version'

### The basics step-by-step



## Scope of the study



Source: Radiotherapy Risk Profile WHO/IER/PSP/2008.12



# The process and how we identify the top 10 potential risks

## HFMEA-light worksheet

List Process steps

Possible Errors/Consequences

Possible Causes

Severity Score

Probability Score

Possible Solutions



# The HFMEA worksheet

Process step description	Possible errors	Possible consequences	Severity score	Severity score (tekst)	Probability score	Probability score (tekst)	Risk score	Possible causes	Possible solutions
Paper concept	Transmission error	False radiation treatment	4	Catastrophical	2	Annual	8	1) No 4-eye-principe 2) Human failure 3) The paper concept is changed, but the electronical concept not	Only an electronical concept (no paper concept)



## Results

### Top 10 findings:

- 10 process steps with the highest risks

### Discussion:

- Review top 10 risks with all participants
- Discuss potential causes
- Discuss the possible risk mitigation
- Agree and implement the improvement actions



## Conclusion

### **Study:**

Identified possible sources of errors for the 1. Chart-Check and developed improvement measures



### **Result:**

This method has been accepted by the employer and established as the department's standard tool for risk analyses

## THANK YOU QUESTIONS?

**Project leader:**

Floor Coremans

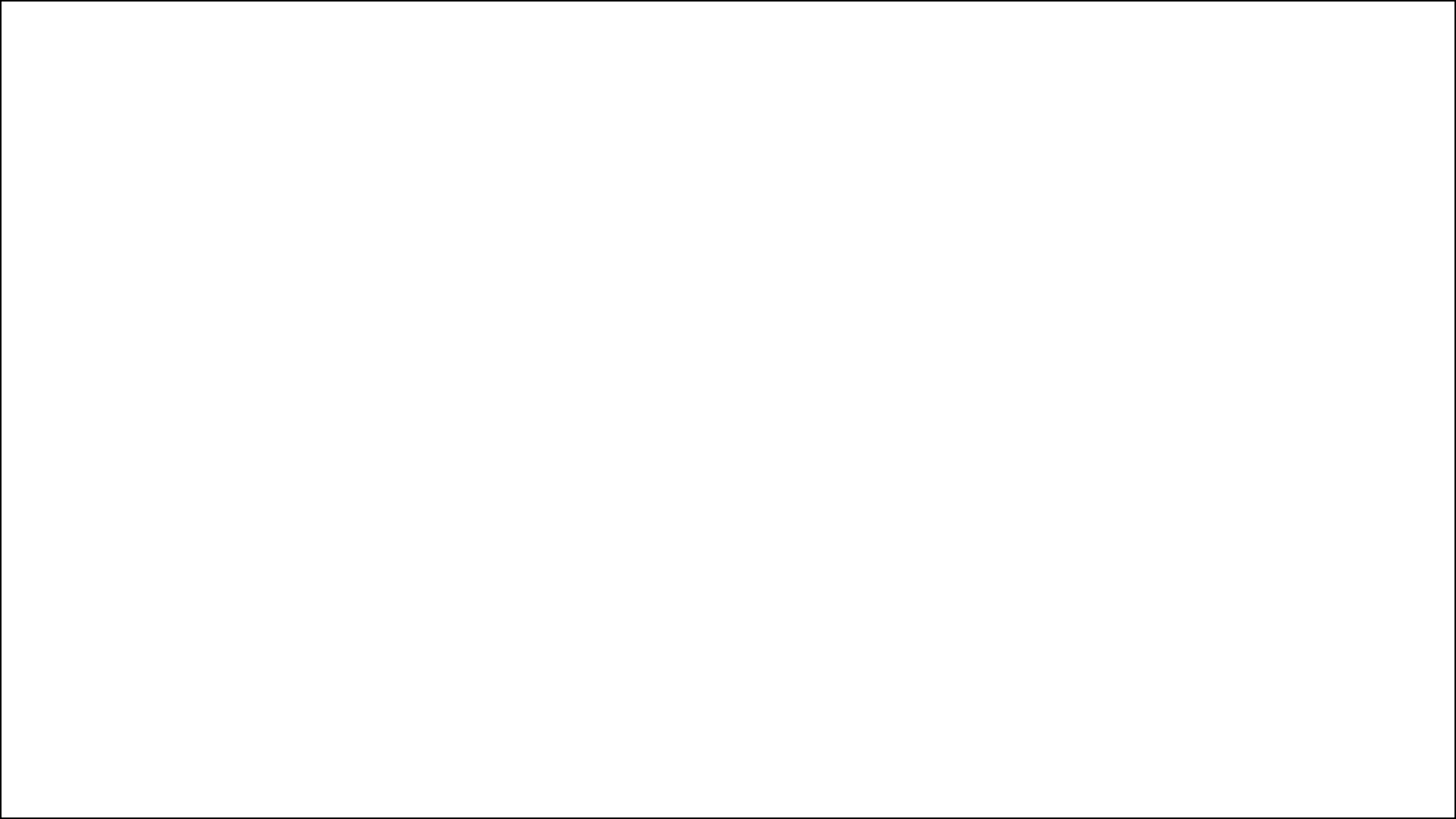
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## Probability and Severity Score

Severity	Score	Description score
Catastrophic	4	The error may lead to serious injury or death to the patient
Major	3	The error may lead to serious permanent damage to the patient's functioning (motor skills, intelligence) and/or have a major impact on the quality of the irradiation.
Low	2	The error has a <u>low</u> effect on patient safety and/or irradiation quality
Small	1	The error has <u>no</u> effect on patient safety and/or irradiation quality

Probability	Score	Description score
Often	4	The error is very likely to occur (once in 5 (>95%) of the 1. Chart-Checks)
Regularly	3	The error is likely to occur within a short period of time (once in 5 to 10 (70-95%) of 1.Chart-Checks)
Annually	2	The error may occur (once in 10-30 (35-70%) of 1.Chart-Checks)
Rarely	1	The error is unlikely to occur (once in 30-70 (<35%) of the 1.Chart-Checks)



# Example: HFMEA worksheet

Process step description	Possible errors	Possible consequences	Severity score	Severity score (tekst)	Probability score	Probability score (tekst)	Risk score	Possible causes	Possible solutions
Set-up bolus	1) Bolus on the wrong side of the machine 2) Bolus change during preparation	1) Over- or underdosage/false radiotherapy treatment (due the wrong bolus position) 2) Skin reaction	3	Major	2	Annual	6	1) Human error	1) Reminder for all Machine Managers (don't change DRR bolus + no imaging planning on bolus set-up fields)

# Boxplots

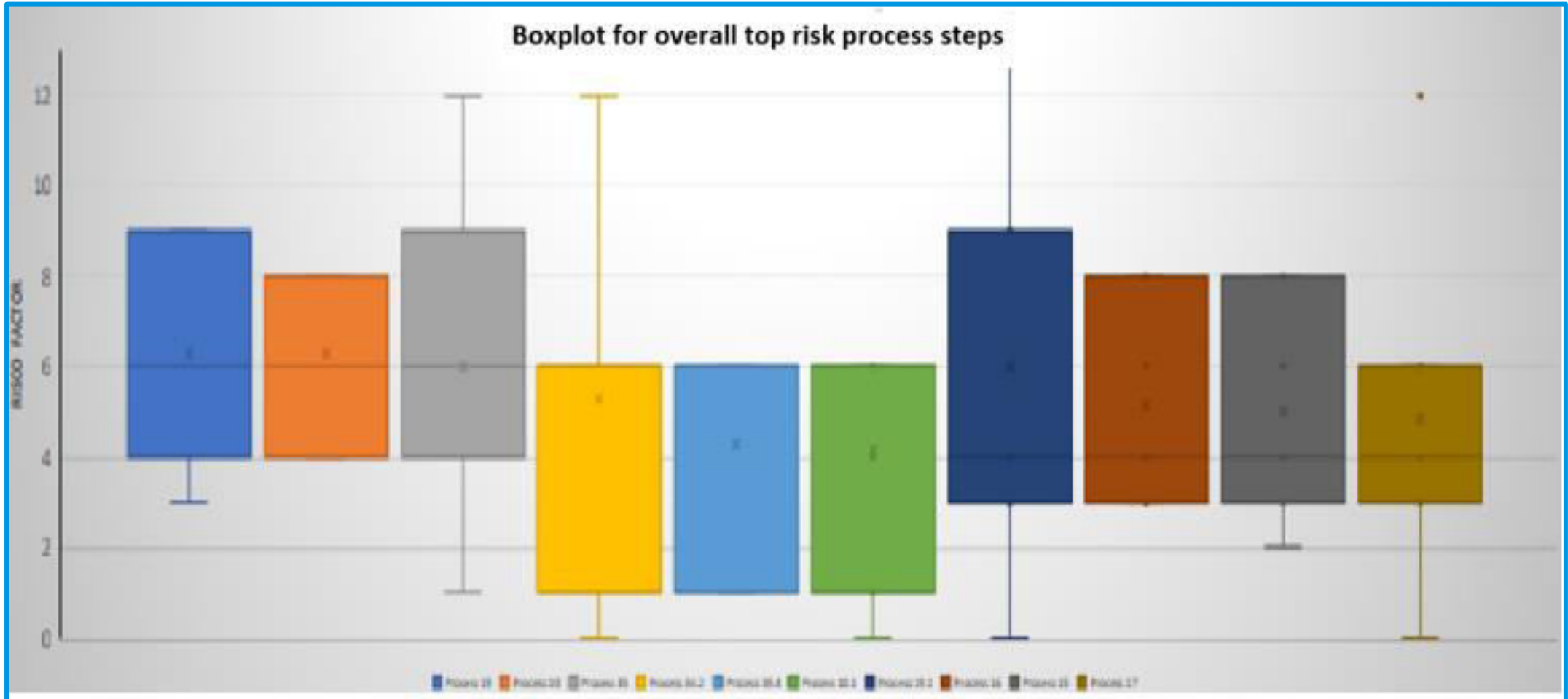
## **Boxplots:**

- We have merged all the individual scores per process step (in Excel)

## Prioritise:

1. Highest minimum: which prioritises all the risks, based on where the minimum scores are the highest
  - several risks with the same priority: therefore we use the second prioritisation
2. Highest maximum: prioritise the highest score per risk
3. Highest standard deviation and Highest average

# Boxplots





## Improvement measures

### **Machine Managers (groups of two) - adjust improvement measure**

- Meeting every 2 weeks: update
  
- 1. Update of various workflows (including 1. Chart-Check, Treatment Preparation, Imaging)
- 2. Tool to document the patient positioning during planning CT more easily
- 3. The morning check document from planning CT updated
- 4. Document in which physicians write planning notes, is modified
  - More clear which scheduling CT was used for radiation planning, as many patients receive multiple CTs
  
- 5. Changed the names of documents (workflows) in our system
  - Advantage: making it easier to see which documents exist.
  - Before, the documents all started with the word `workflow` and now it immediately says for example Breathhold Planning-CT, OSMS radiations, .....