Bundesamt
für Strahlenschutz

The use of VR for training in interventional radiology

BfS project 3621S42350

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(a) Federal Office for Radiation Protection; (b) Northdocks GmbH

EUTERP „Train the trainer“ event, 25th June 2025, Milano

Conflict of interest:

The software was funded by the German Ministry of Environment under supervision of the **BfS** and programmed by the company **Northdocks GmbH**

total amount: 201.879,22 €

Technical supervision: Dr. Hugo de las Heras Gala

What is the effect of protective shielding in interventional rooms? - How can we train workers?

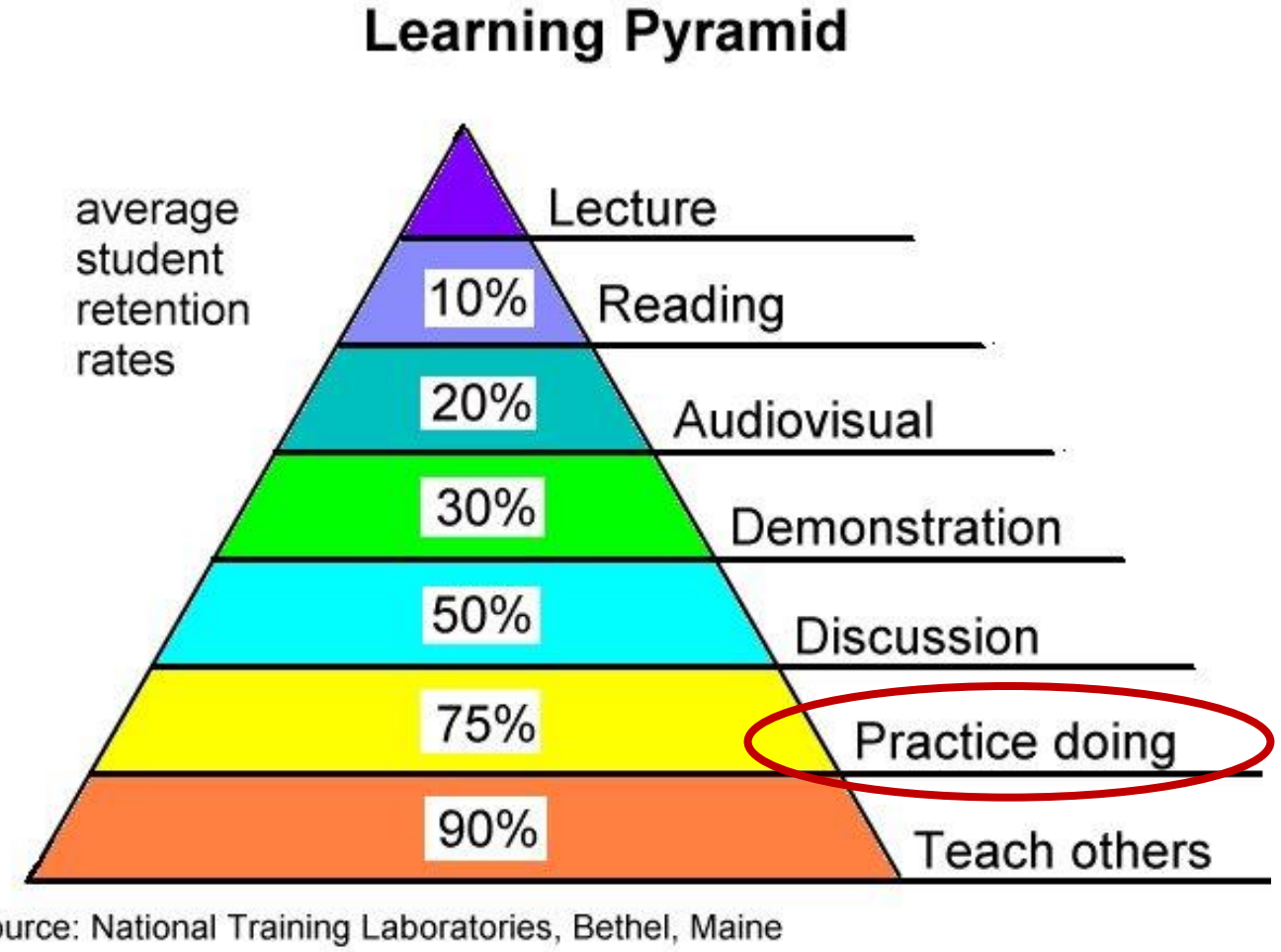
Practical exercise is the **most efficient method** to learn

“I hear and I forget,
I see and I remember,
I do and I understand.”

- “Confucius”, ca. 500 b.c. -

„You cannot teach anything; you can only help to find things within oneself.“

- Galileo Galilei, 17. Jahrhundert -



Learning by Doing or Doing Without Learning?
The Potentials and Challenges of Activity-Based Learning

- A. Skulmowski (Karlsruhe Univ. of Education), 2024 -

Percentage of workers with measurable exposure in Germany (2021)

Out of 102.000 measurable readings:

Medicine: 54 %

Flying staff: 31 %

General industry: 10 %

Nuclear industry: 3 %

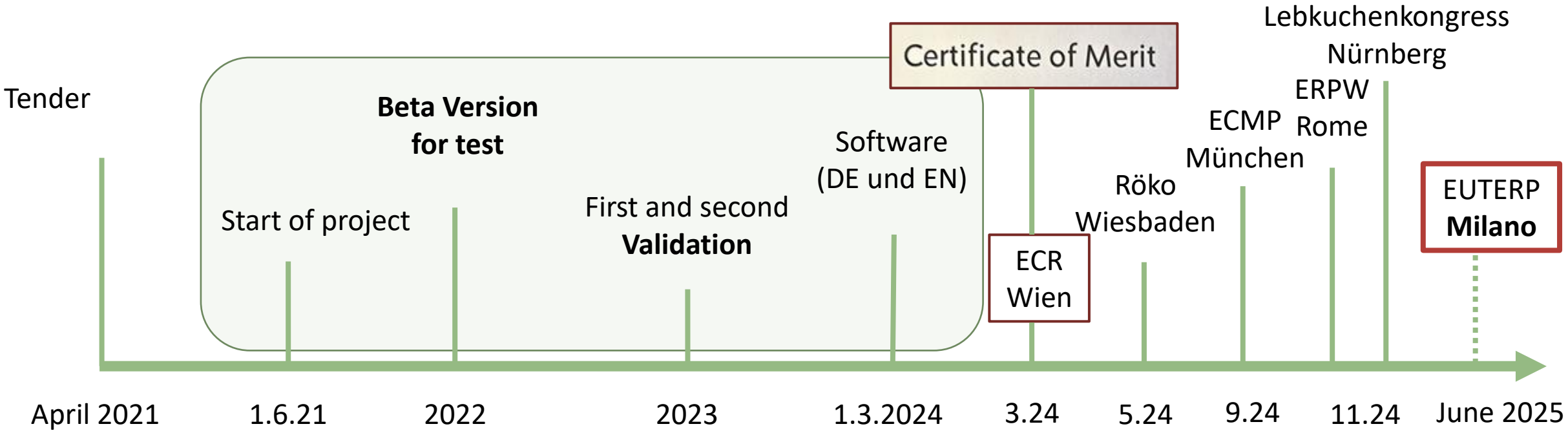
Research and training: 2 %

Old materials: 0,5 %

Radon: 0,2 %

Source: BfS (2021)

The BfS opened a tender in **2021** – The result is a free **VR-environment for download**



This project is in line with the **UN sustainable development goals** (Target 3.c)

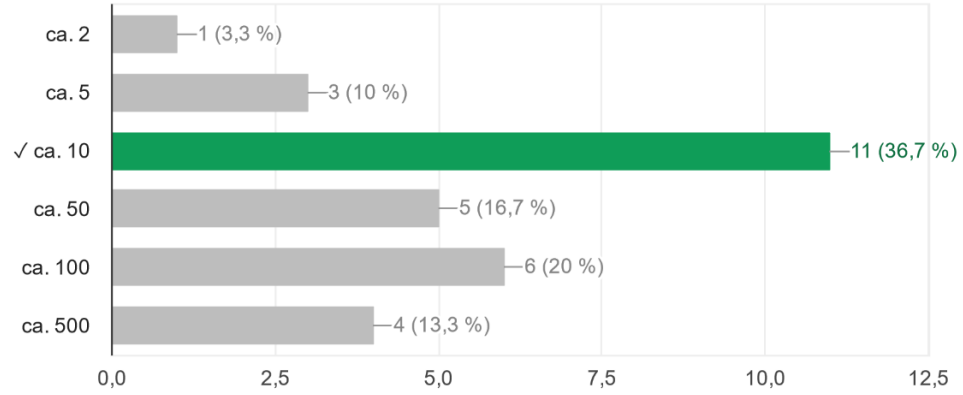
UN sustainable development goals, **target 3.c**:

„***Substantially increase health financing and*** *the recruitment, development,* ***training*** *and retention* ***of the health workforce in developing countries****, especially in least developed countries and small island developing States*“

The validation consisted in a **questionnaire** before and after a training of 20 minutes by **32 participants** (radiographers, radiologists and physicists; Uni-clinics Cologne and Munich)

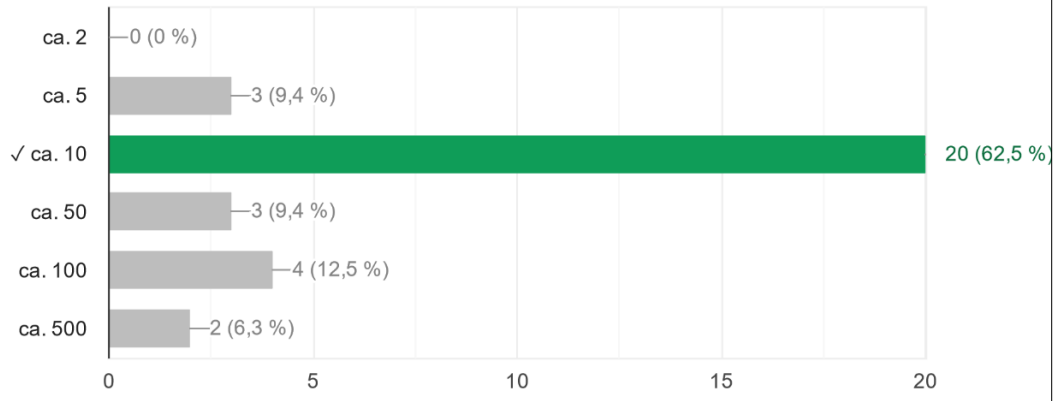
Before the training

Reduction-factor in the effective dose when all protection measures are used (under couch, apron and thyroid shield)



After the training

Reduction-factor in the effective dose when all protection measures are used (under couch, apron and thyroid shield)



In the **virtual room** (cathlab), you can interact with the **C-arm** and all **protection measures**

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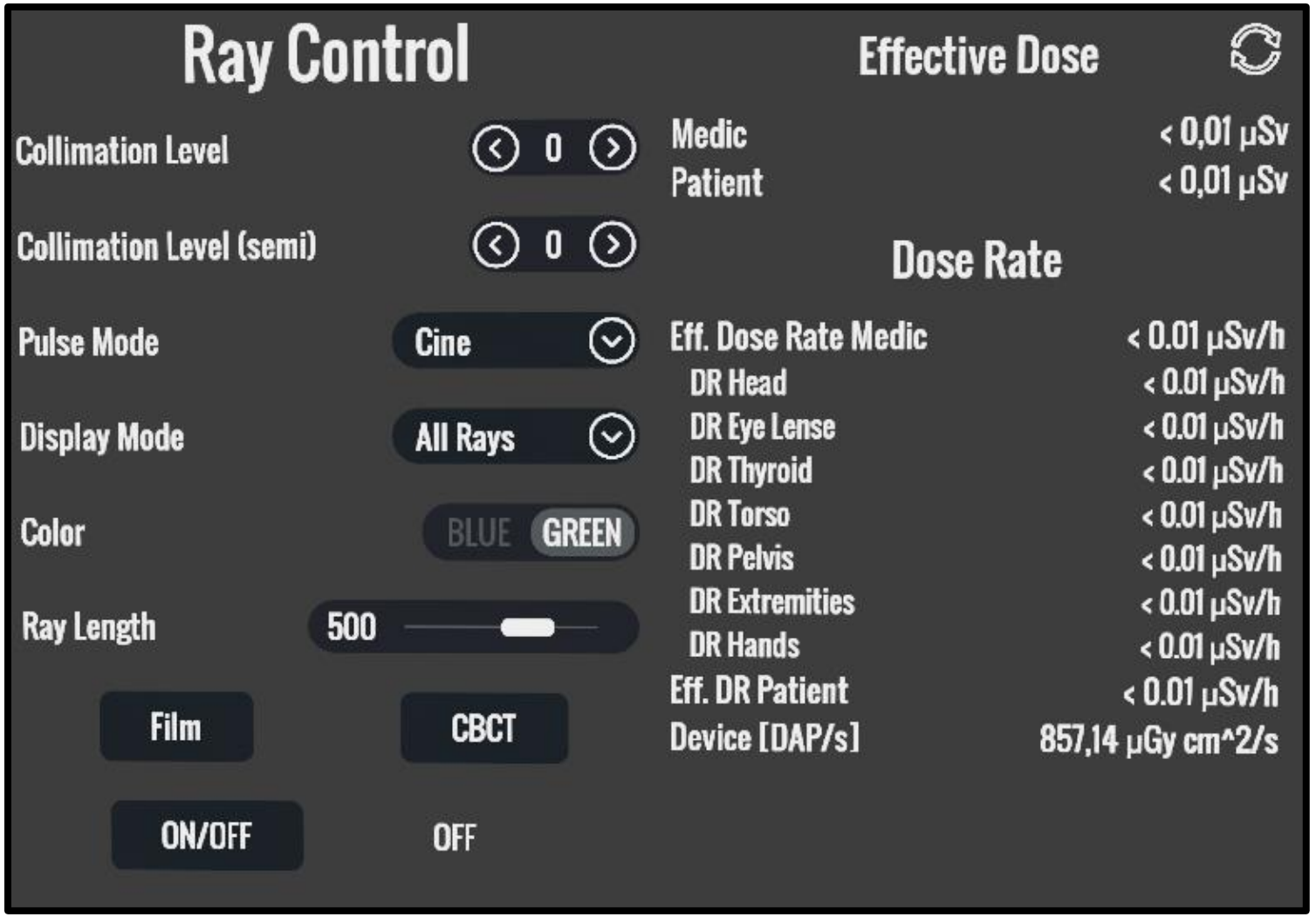
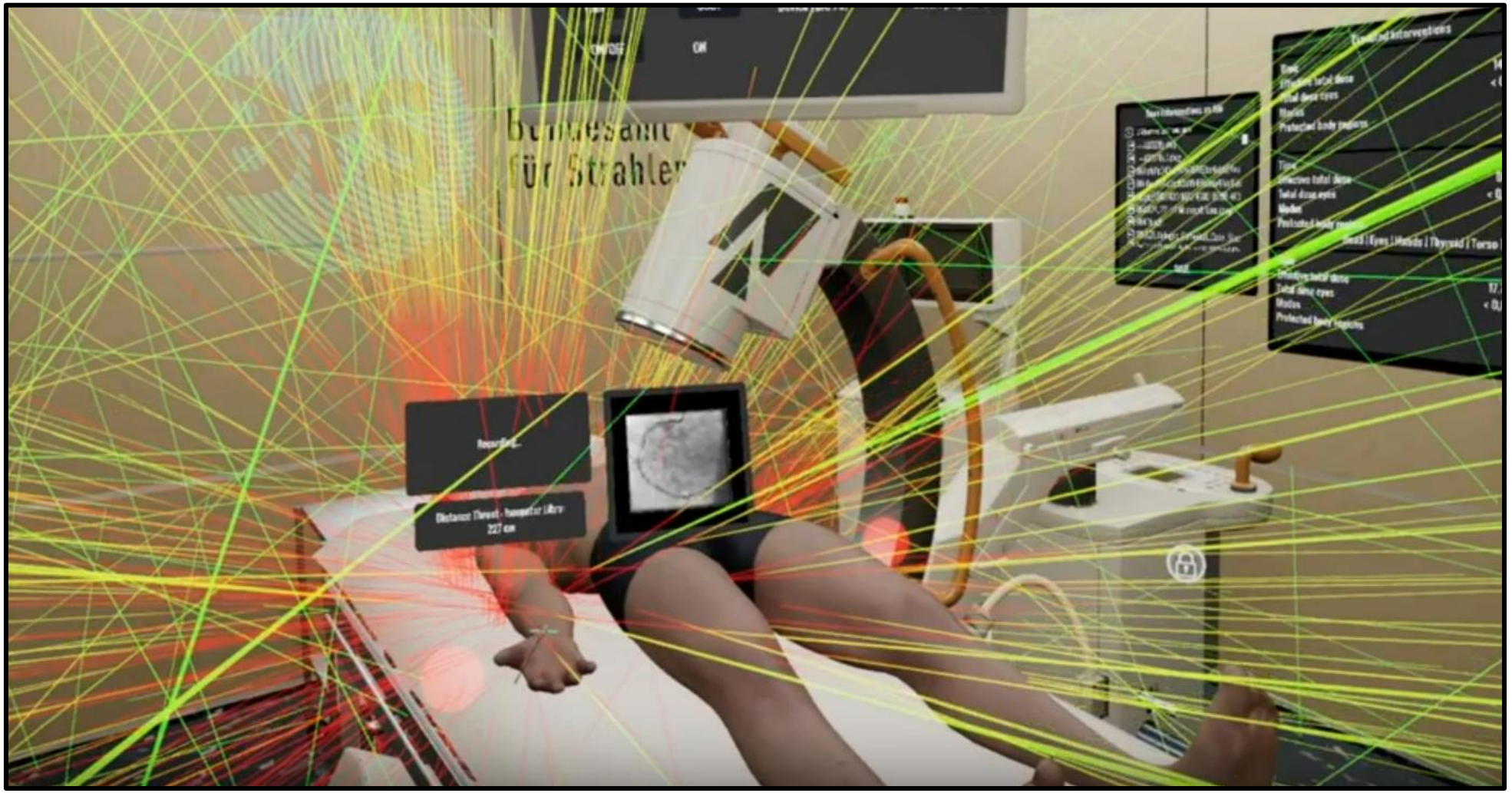


Scattered radiation, as well as organ and **effective dose values** of the staff become **visible**



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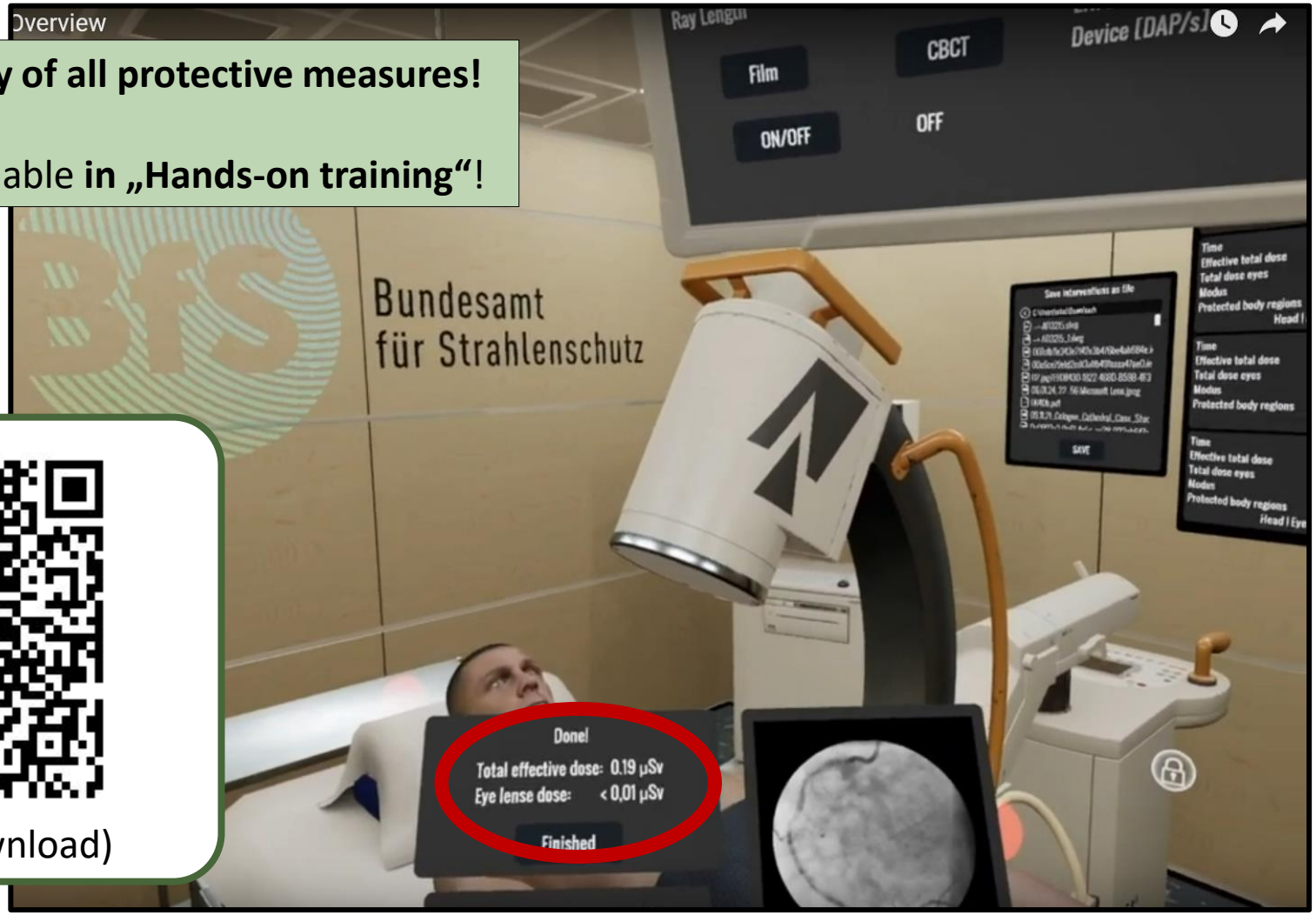
-> Test the efficiency of all protective measures!

The software is available **in „Hands-on training“**!

(Infos and download)



Distance

Thyroid-shield

Aprons

Goggles

Under-couch shield

Lead screens

X-ray source:
- *Position, orientation*
- *Pulse frequency*
- *Collimation*
- Detector-to-patient

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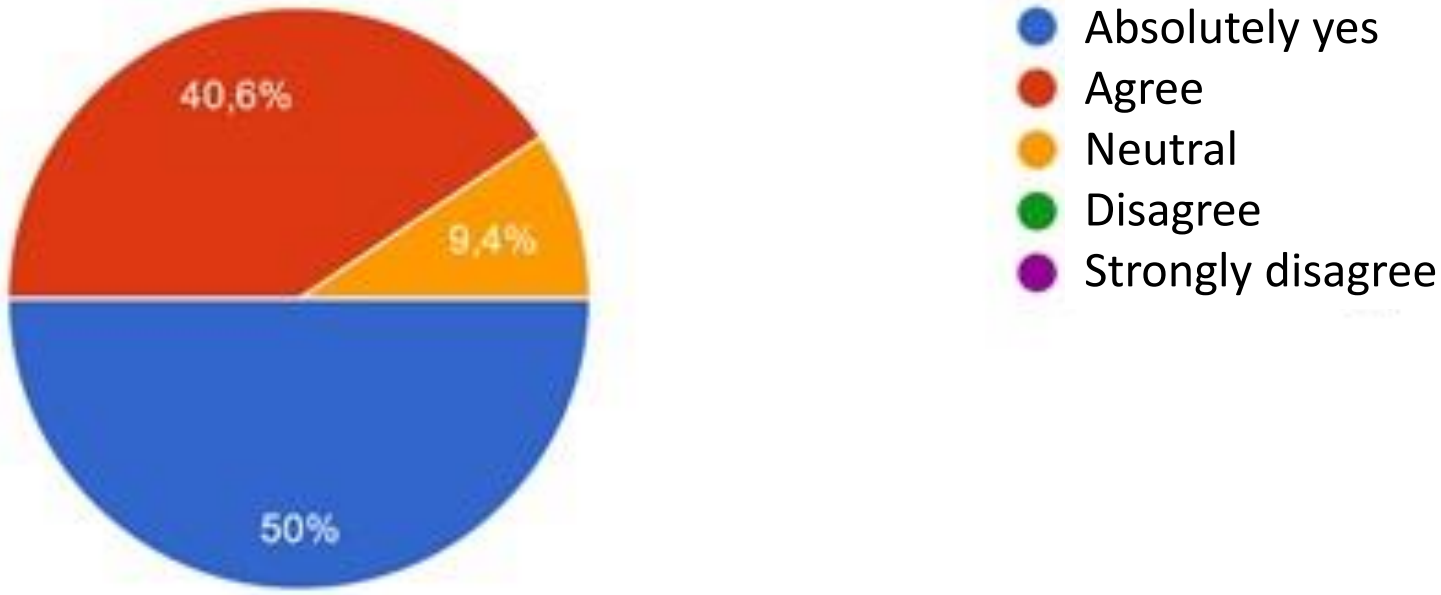
The display of information was useful for my understanding

(32 answers)



In a realistic environment…