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Audits in Radiotherapy in Switzerland

Anja Stüssi
Radiation Protection Division
Federal Office of Public Health

International Conference on Modern Radiotherapy
Versailles, France
2. - 4. December 2009

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Overview

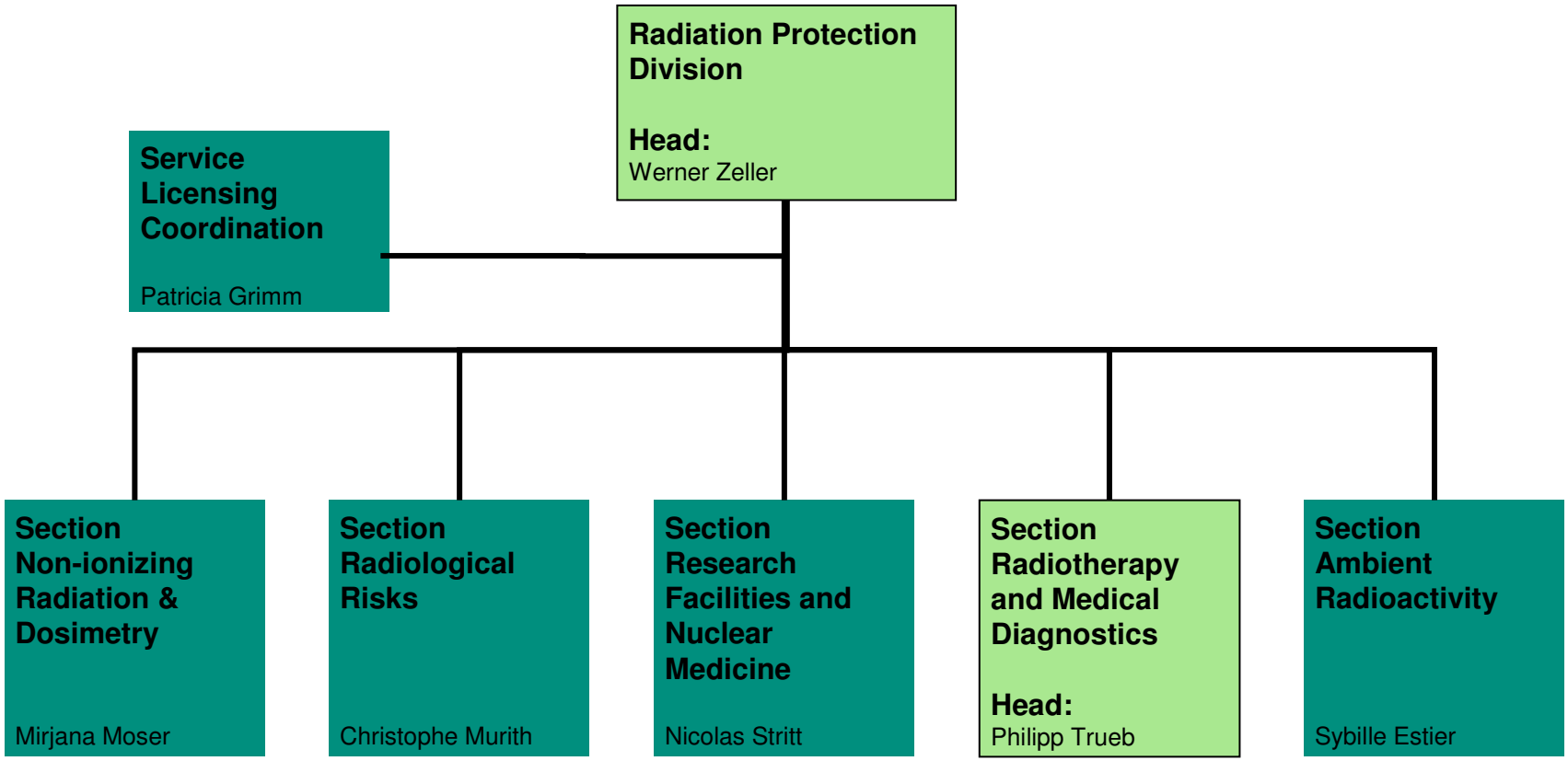
I. Swiss Regulatory Body

II. Audits in Low- and High-Voltage Radiotherapy

III. Audits in Megavoltage Radiotherapy (Linear Accelerators)

I. Swiss Regulatory Body

Federal Office of Public Health



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Radiotherapy and Medical Diagnostics

P. Trueb

T. Theiler

R. Landis

M. Marconato

R. Treier

A. Stüssi

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II. Audits in Low- & High-Voltage Radiotherapy:

Low- and high-voltage therapy units: 40

Low-voltage therapy units (≤ 100 kV): 31

-> 13 installed in hospitals

-> 18 installed in medical practices

High-voltage therapy units (> 100 kV): 9

-> all installed in hospitals

Quality Assurance Program:

- **Periodicity of the quality checks:**

  (Swiss ordinance of radioprotection)

  low-voltage X-ray therapy units: every 3 years

  high-voltage X-ray therapy units: every year

- **Parameters, their tolerances and the responsibilities:**

  (directive published 2005 by Federal Office of Public Health)

Mentor principle:	Medical Physicist performs physical tests and consults the medical doctor.
Example parameters:	Size and position of the beam ± 2 % / ± 2 mm Homogeneity of the beam ± 15 % Dose rate ± 3 %

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Audit Program:

Audits cover various aspects of X-ray therapy:

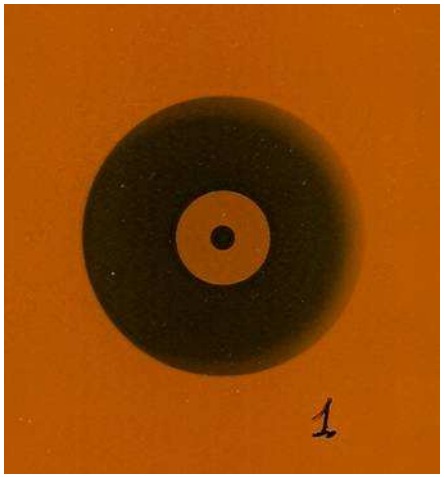
- organizational and administrative aspects
- dose prescription
- constructional radiation protection
- radiation protection means
- quality assurance program

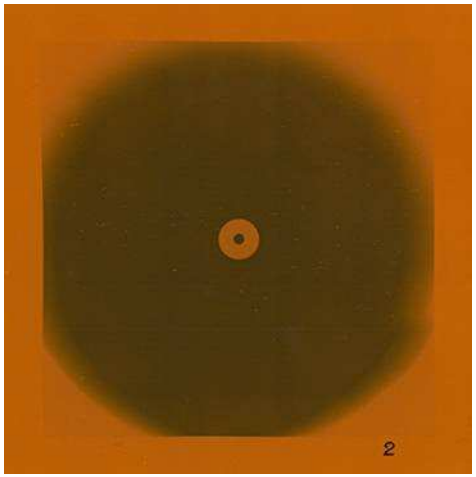
21 of 40 units already audited:
-> 17 low- voltage units
-> 4 high- voltage units

Preliminary Conclusions:

- Poor coordination of the measurements performed by the Medical Physicist and the qualified technical personnel of the manufacturer (Communication, Dermatologist)

- Poor state of the tubes, aperture (homogeneity, size,…)





III. Audits in Megavoltage Radiotherapy (Linear Accelerators):

Radiotherapy Departments: 27

Linear Accelerators: 57

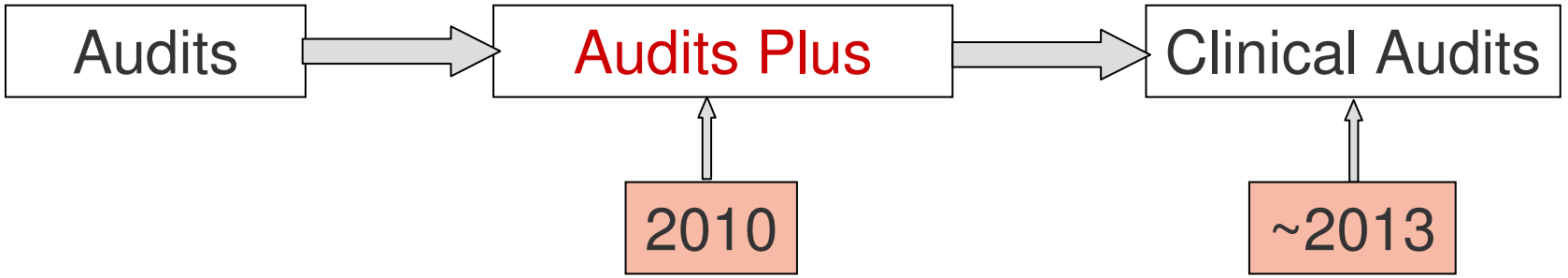
Audits → **Clinical Audits**

- quality checks of the technical equipment
- constructional radiation protection
- organizational and administrative aspects

by FOPH

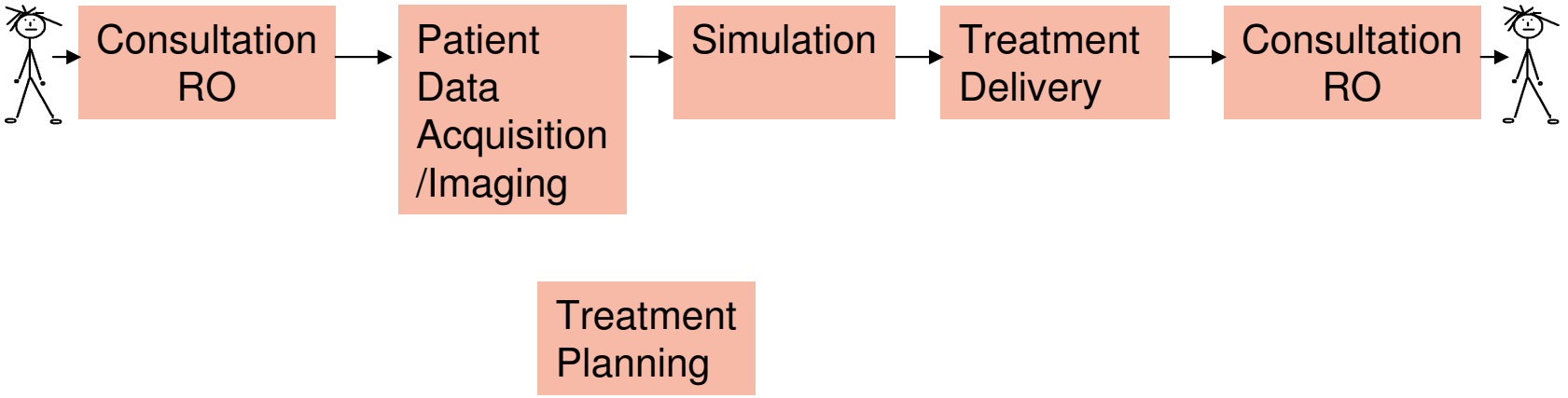
assessment of processes
by multi disciplinary teams
(physicians, technicians,
physicists)

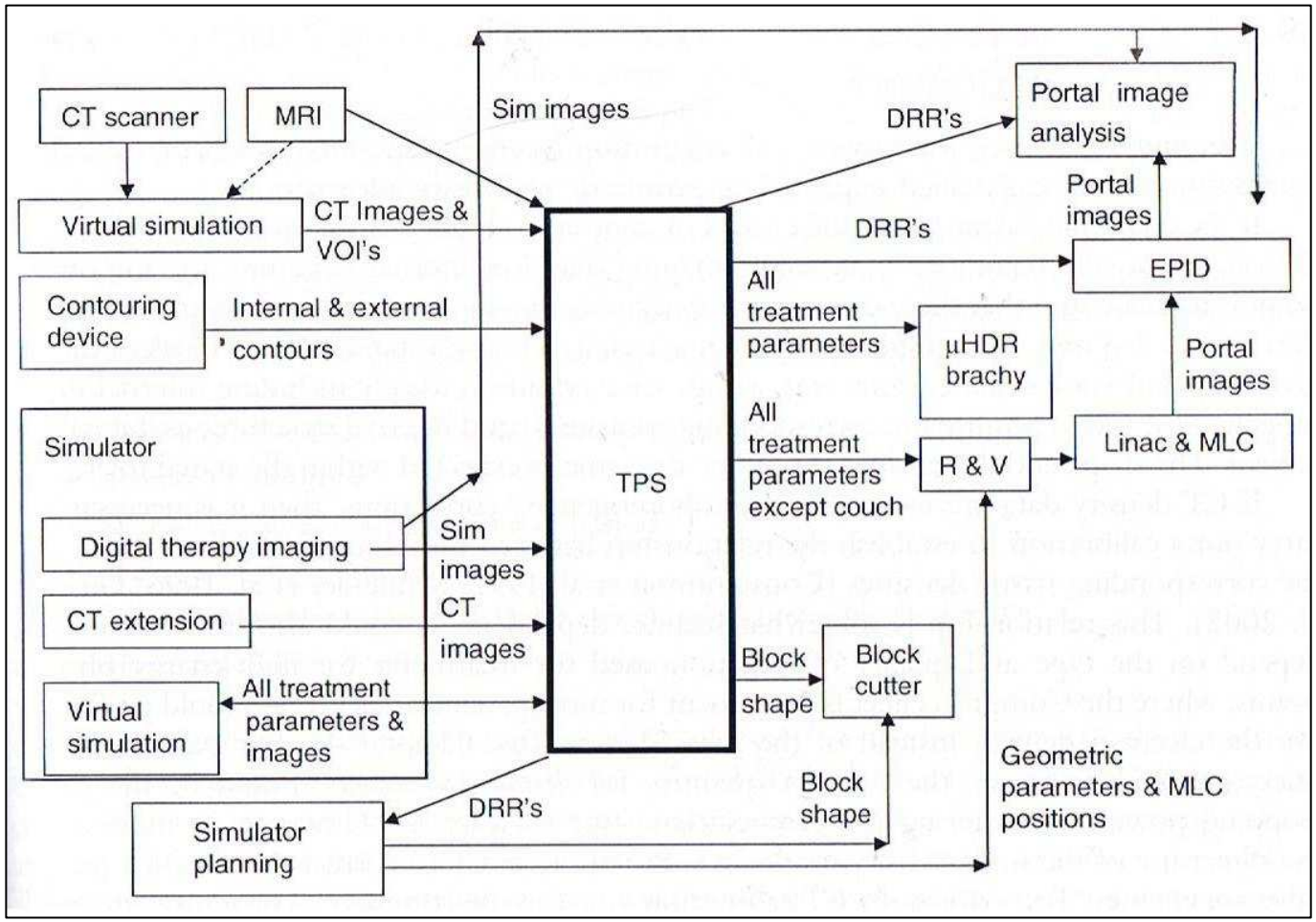
A clinical audit is a systematic and continuous assessment of all radiological processes performed during the clinical pathway of a patient*:* Is a specific radiological process based on the principle of "good clinical practice"?


Audits
Audits Plus
Clinical Audits
2010
~2013

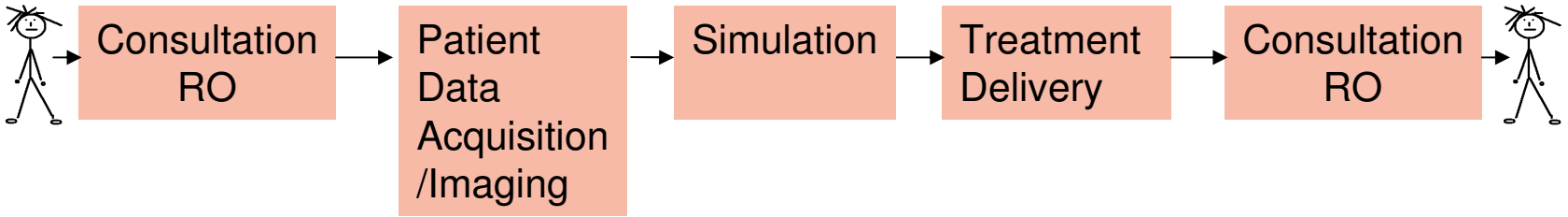
Audit Plus:

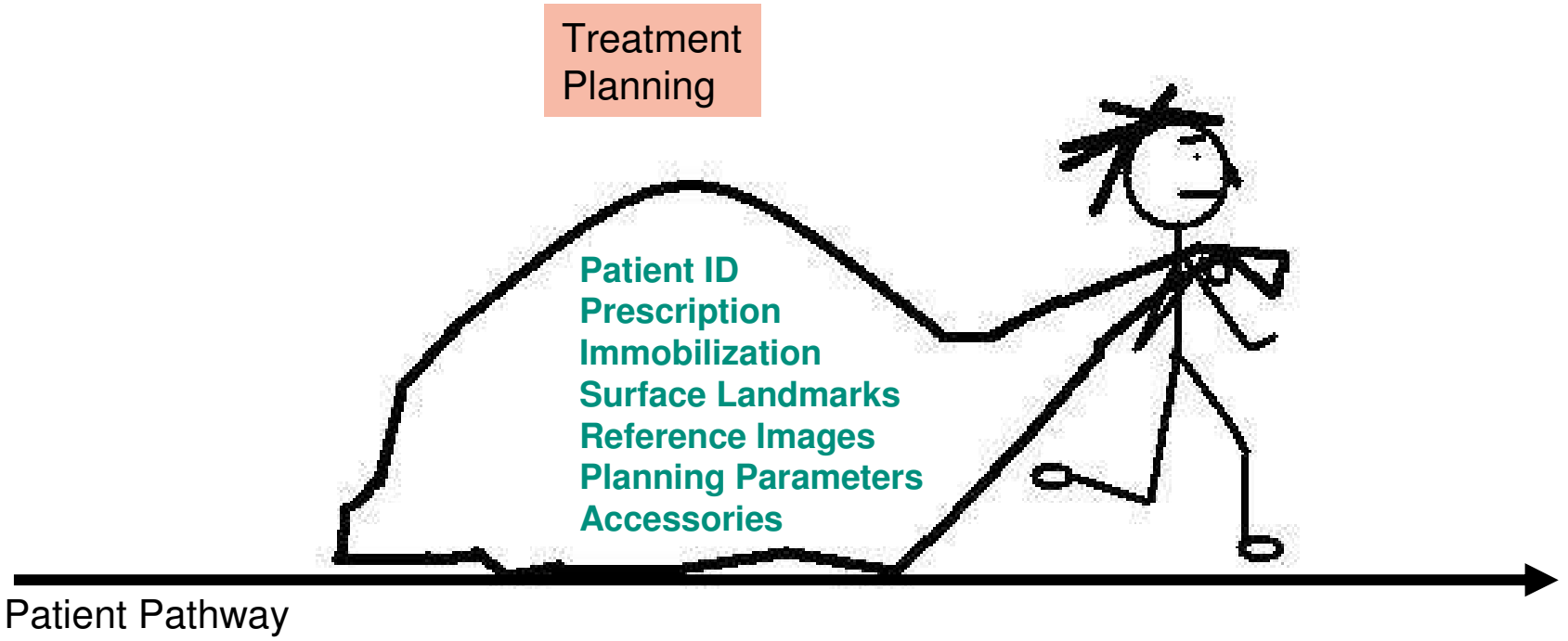
Patient Pathway

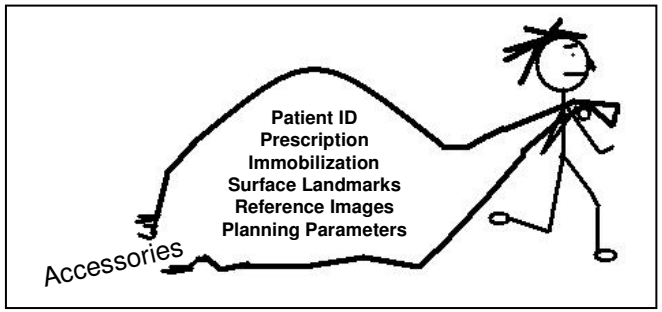




From: Mayles, Nahum & Rosenwald (2007) Handbook of radiotherapy physics, New York: Taylor and Francis


Consultation RO
Patient Data Acquisition /Imaging
Simulation
Treatment Delivery
Consultation RO


Treatment Planning
Patient ID
Prescription
Immobilization
Surface Landmarks
Reference Images
Planning Parameters
Accessories
Patient Pathway



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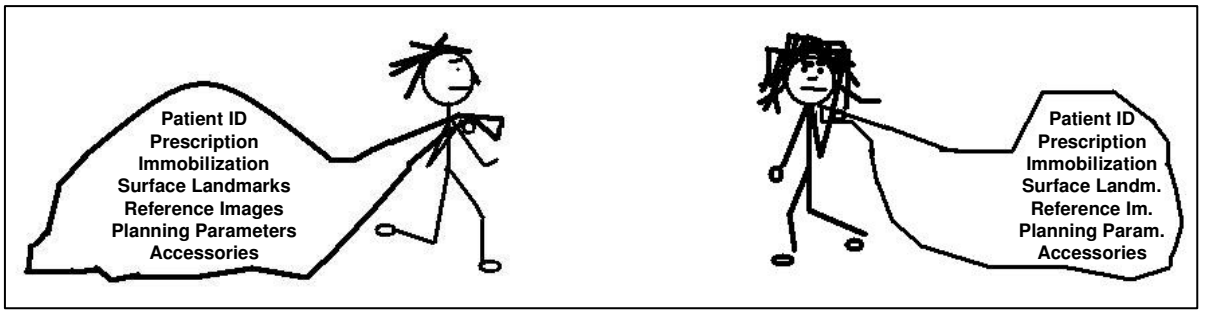

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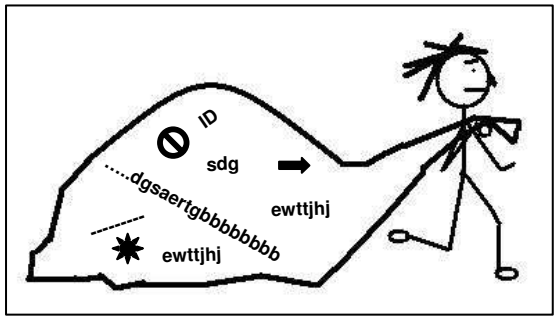
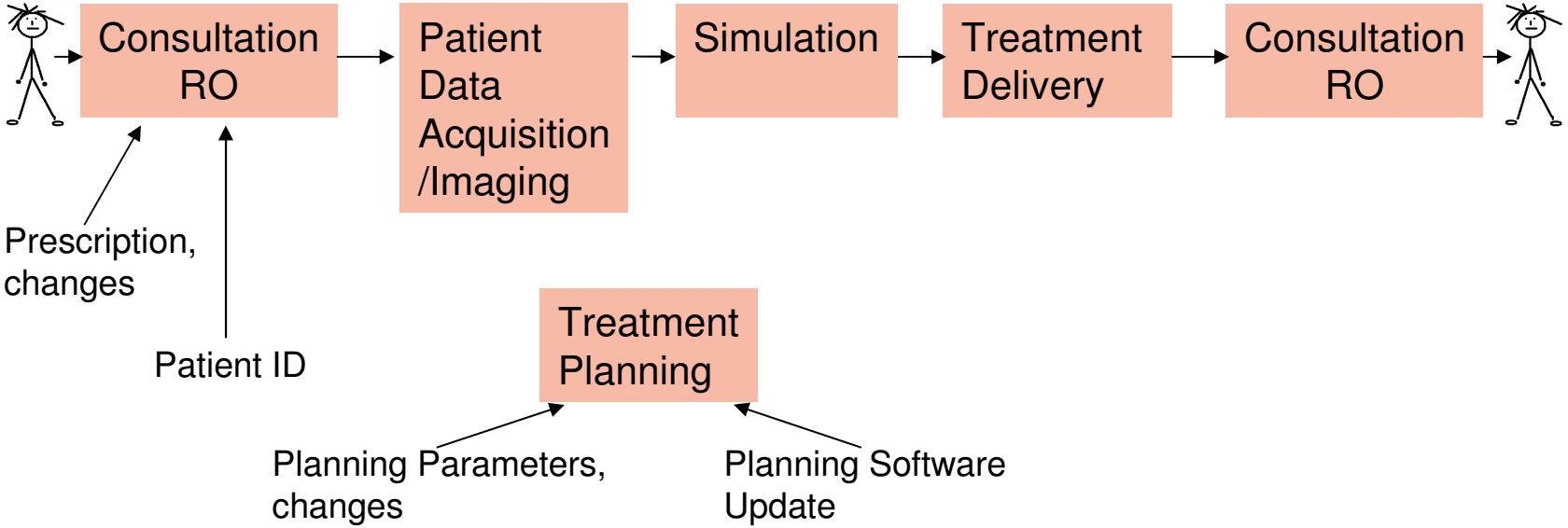


- Cross checks
- Independent checks
- Design & documentation of processes
- Number of qualified personnel
- Education

….



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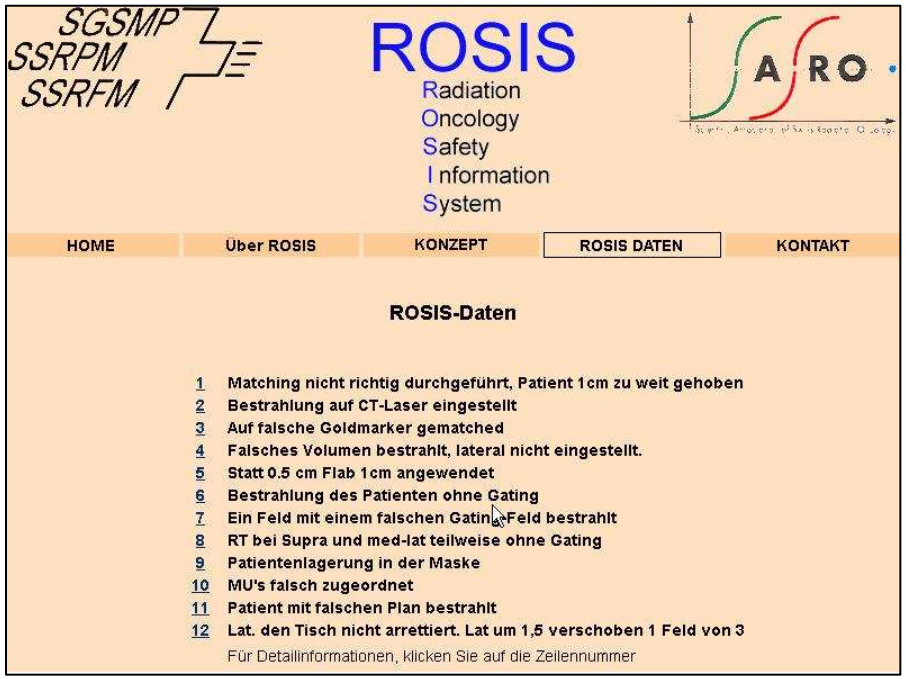
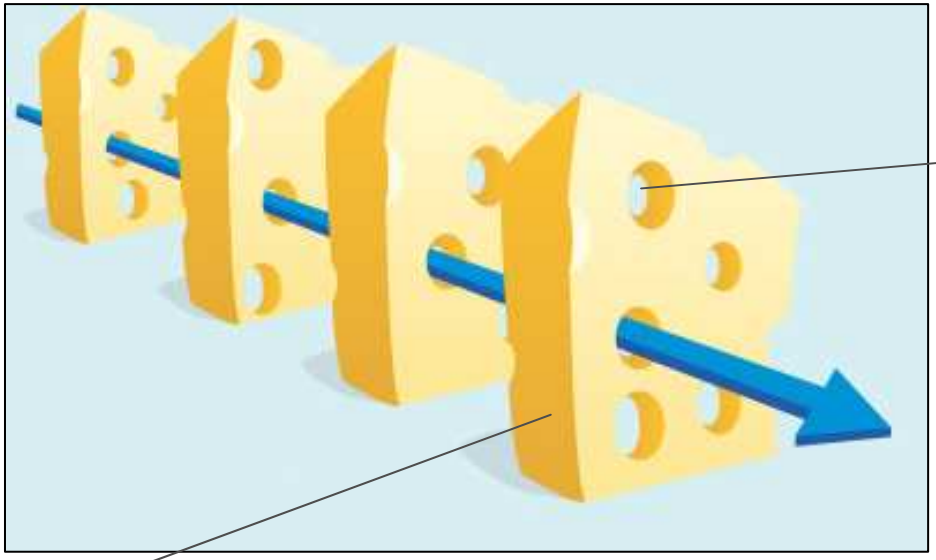
Recording and Reporting of Incidents

CIRS (Critical Incident Reporting System)



In collaboration with the FOPH, the Swiss Society of Radiobiology and Medical Physics (SSRMP) and the Scientific Association of Swiss Radiation Oncology (SASRO).

Detection System: Swiss Cheese Model*:



Error forcing conditions

Barriers

Human error is inevitable, so we need to design safety systems

* J. Reason

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Thank you very much for your attention!