Medical Physics for Patient Benefit

The Journey of an Ionization Chamber

The IAEA celebrates the International Day of Medical Physics
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Introduction:
The Journey of the Ionization Chamber

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Medical Physics for Patient Benefit

Radiation is used to **diagnose and treat patients**.

The **correct amount** of radiation is crucial.

We need to measure it **correctly and accurately**.

**Consistency** of measurements is important.
The role of a Medical Physicist in dosimetry

Medical physicists perform **dose measurements**.

**Ionization chambers** are used for this purpose.

The chambers must be **calibrated**.

Dosimetry = Quantifying the amount of radiation
Calibration

Measured values of a meter are compared with the calibration standard “the correct value”
Traceable calibration

National standard

Calibration

Measurement: “This is 1 kg”
National traceability

Calibration

Measurement

National standard

“This is 1 kg”
International traceability

International primary standard: “This is 1 kg”

Country 1: “This is 1 kg”
Country 2: “This is 1 kg”
Country 3: “This is 1 kg”
Traceable calibration

1 Gy

National standard

Calibration

SSDL
Secondary Standards Dosimetry Laboratory

Measurement

“This is 1 Gy”
International traceability

International primary standard: “This is 1 Gy”

Country 1: “This is 1 Gy”

Country 2: “This is 1 Gy”

Country 3: “This is 1 Gy”

PSDL
Primary Standards Dosimetry Laboratory
Establishment of the dose quantity in a **PSDL**

Calibration of a ionization chamber in an **SSDL**

Medical Physicist use a calibrated ionization chamber

Medical Physicist measures radiation dose in a hospital

The radiation dose to a patient is correct