

# **Supplement 191: Patient Radiation Dose Reporting (P-RDSR)**

**Supplement is developed by DICOM Working Group 28  
(WG-28-Physics)**

- Current Radiation Dose SR contains only information about the x-ray system or information the x-ray system can determine, e.g.:
  - radiation output, geometry, x-ray source, detector system, etc.
- Estimation of patient/organ dose requires knowledge of:
  - Radiation beam characteristics
  - Models of the patient/organs
  - Models of radiation interaction within the patient
- Methods to do patient dose estimations are being developed and improved continuously
  - storage of these estimations in a different object would allow more versatile utilization of the data

- Goals of the Patient Dose SR

- Store the results of Patient Organ Dose calculations:
  - of a SINGLE procedure or MULTIPLE procedures
  - including one or more modalities and procedure steps/phases
  - of one or more organs
- Exchange intermediate results with peers

- Examples of modalities and procedures:

- **Single modality, single procedure step**

- **CT**
      - internal organ dose
      - eye dose
    - **XA/RF** (one time point)
      - skin dose map
      - internal organ dose
    - **Mammography**
      - glandular dose
    - **Projection x-ray (CR/DX)**
      - entrance skin dose
      - internal organ dose
    - **NM/PET**
      - internal organ dose

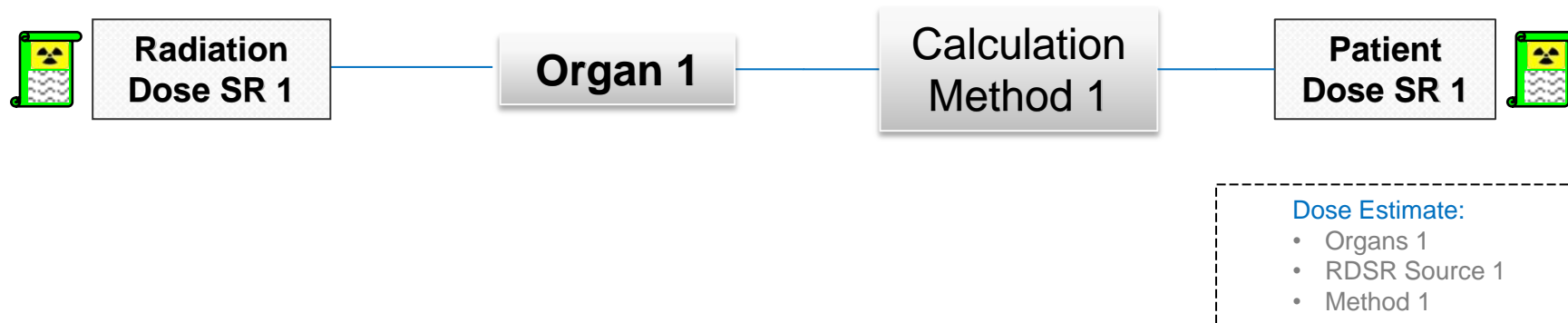
- **Multi-modality, single procedure step**

- **SPECT and PET/CT**
      - internal organ dose

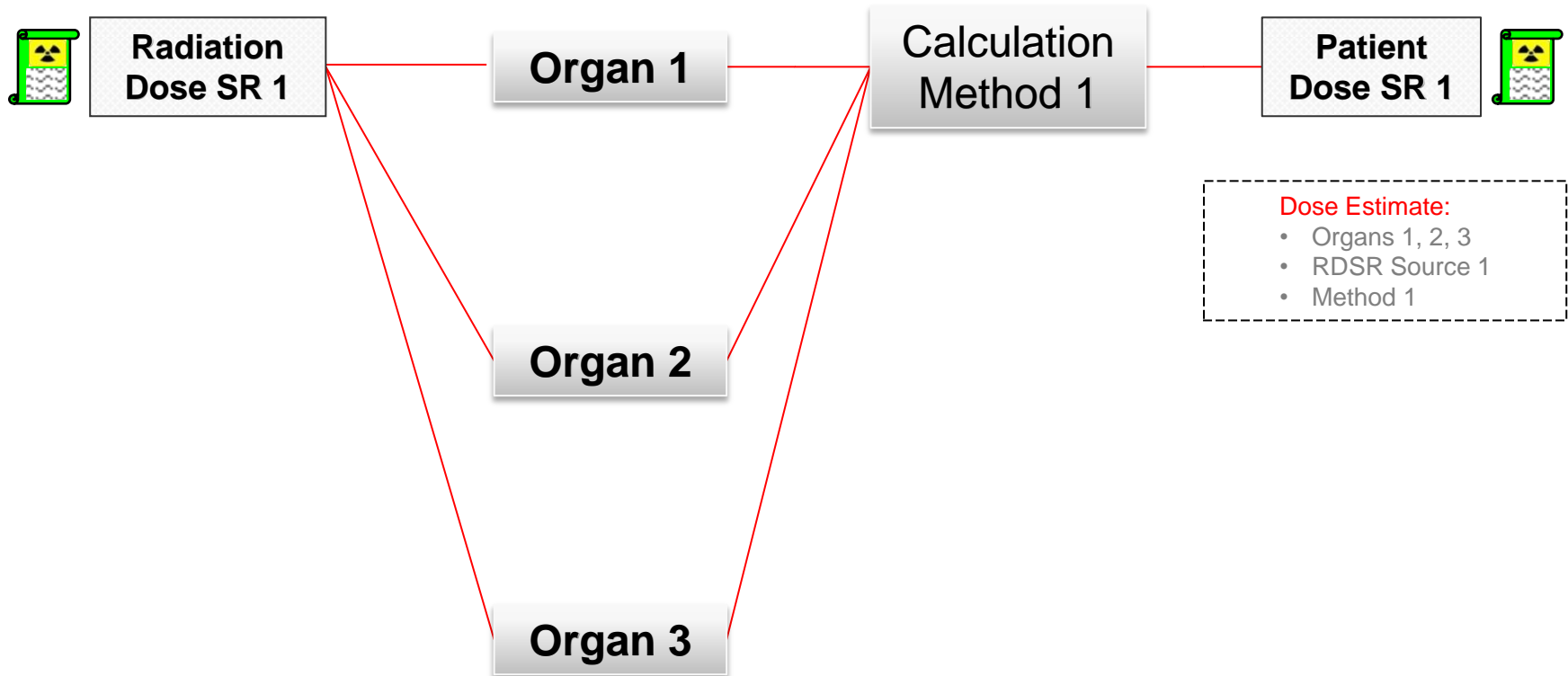
- **Single modality, multi-procedure step**

- **CT**
      - internal organ dose
      - eye dose
    - **XA/RF** (multi time points being combined)
      - skin dose map
    - **XA** localization / diagnostic plus intervention
      - skin dose map
      - internal organ dose
    - **Mammography/Projection X-ray**
      - Tomosynthesis

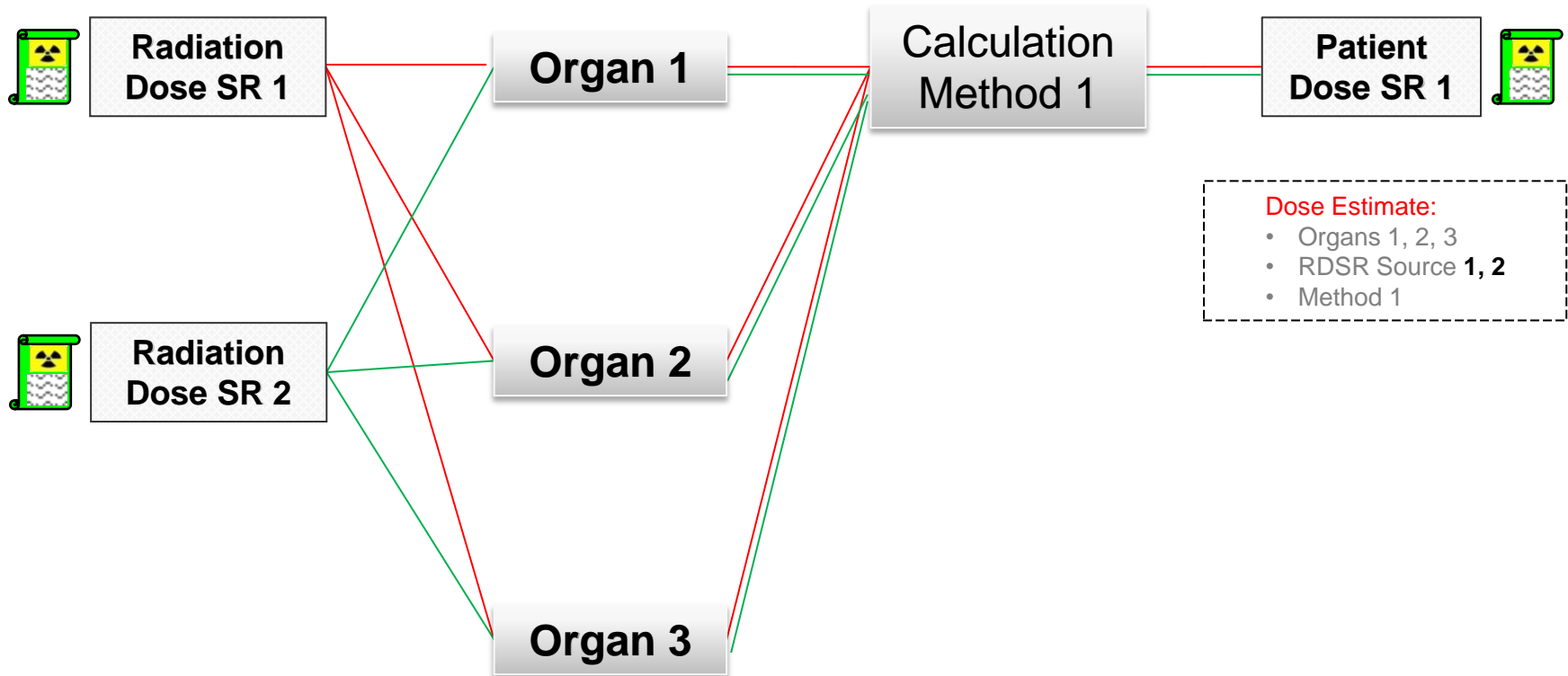
## Data flow – simple case



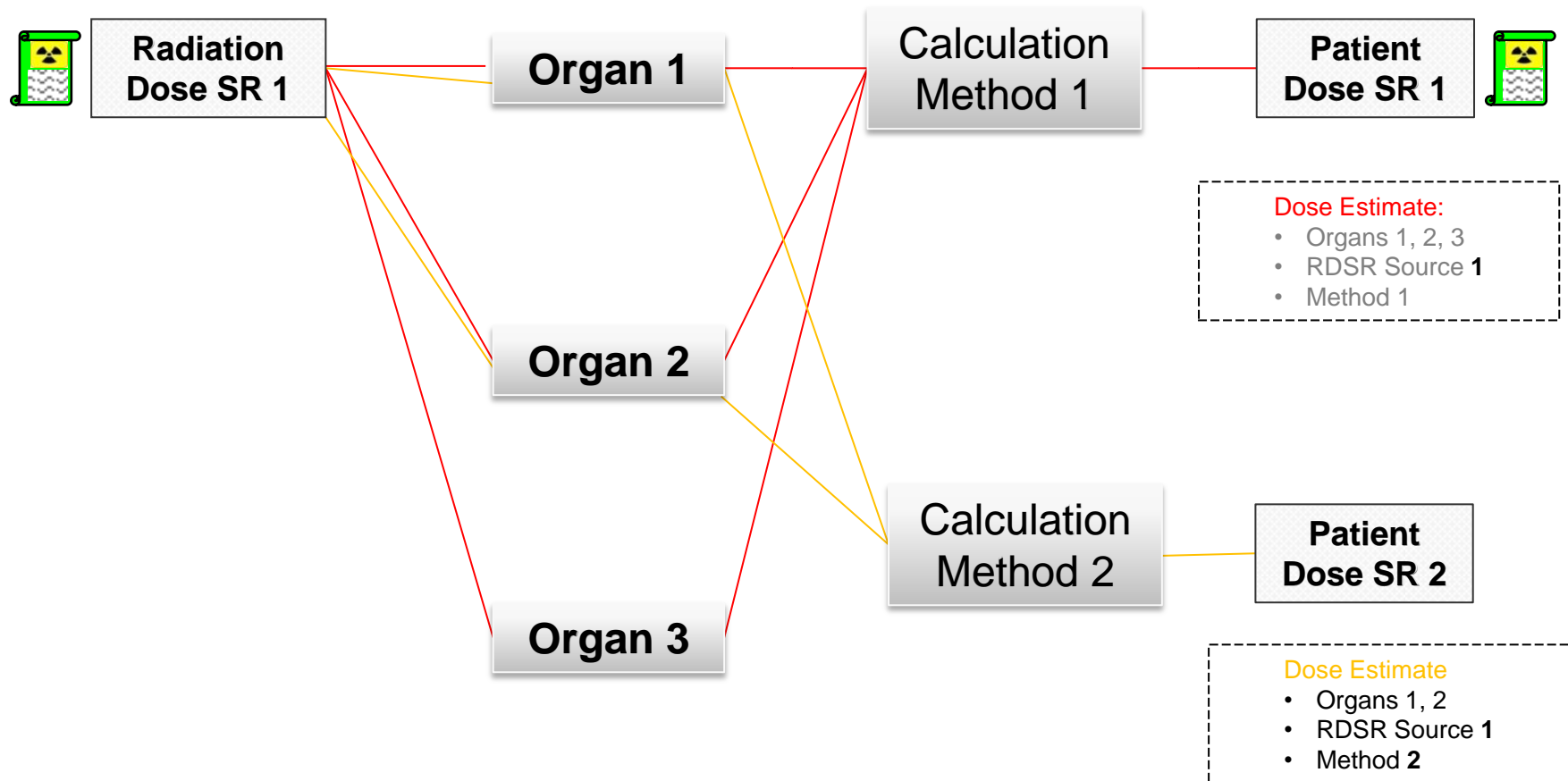
## One RDSR, multiple organs



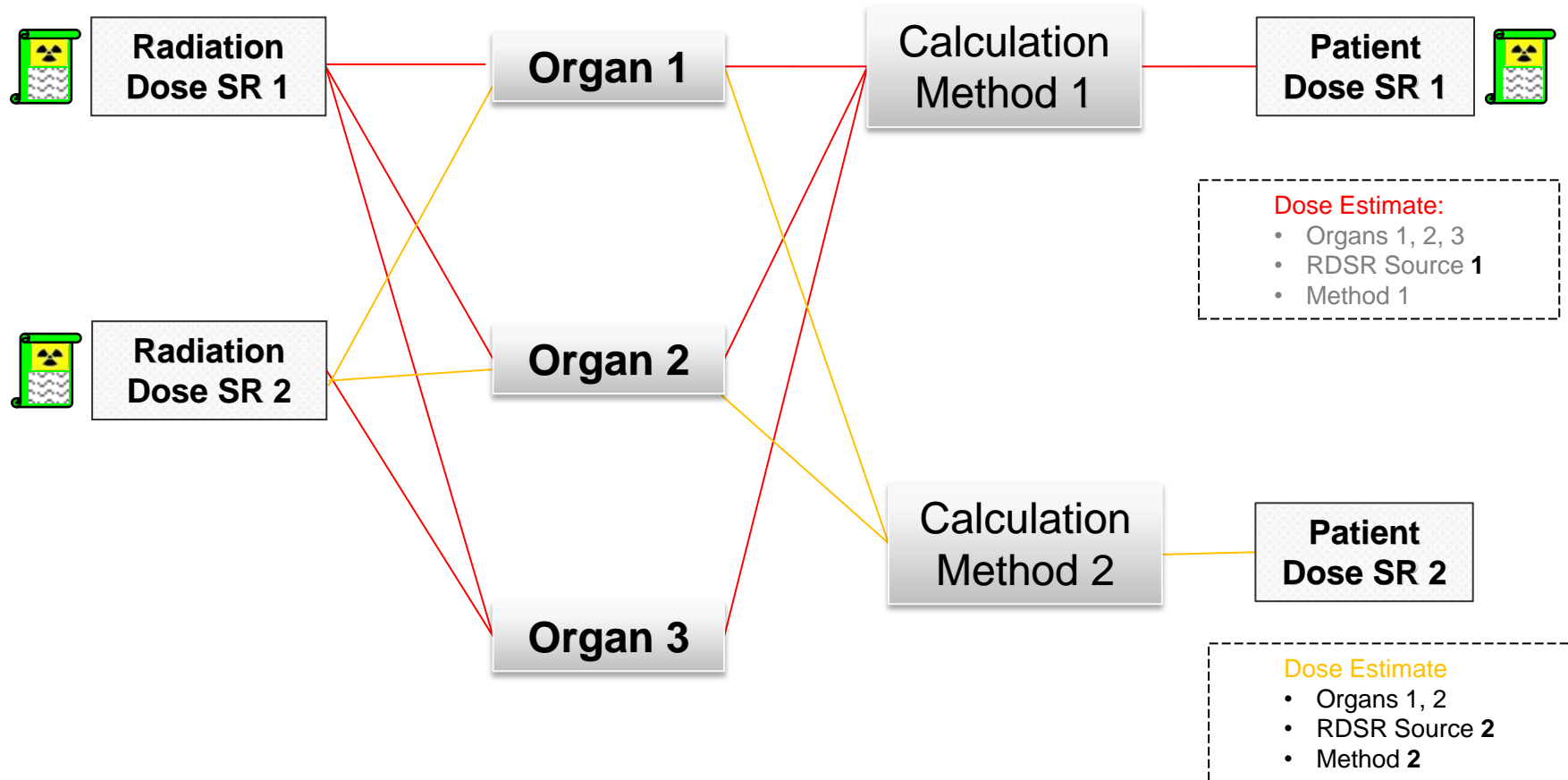
## Multiple RDSRs, multiple organs



## Multiple RDSRs, multiple organs, multiple methods

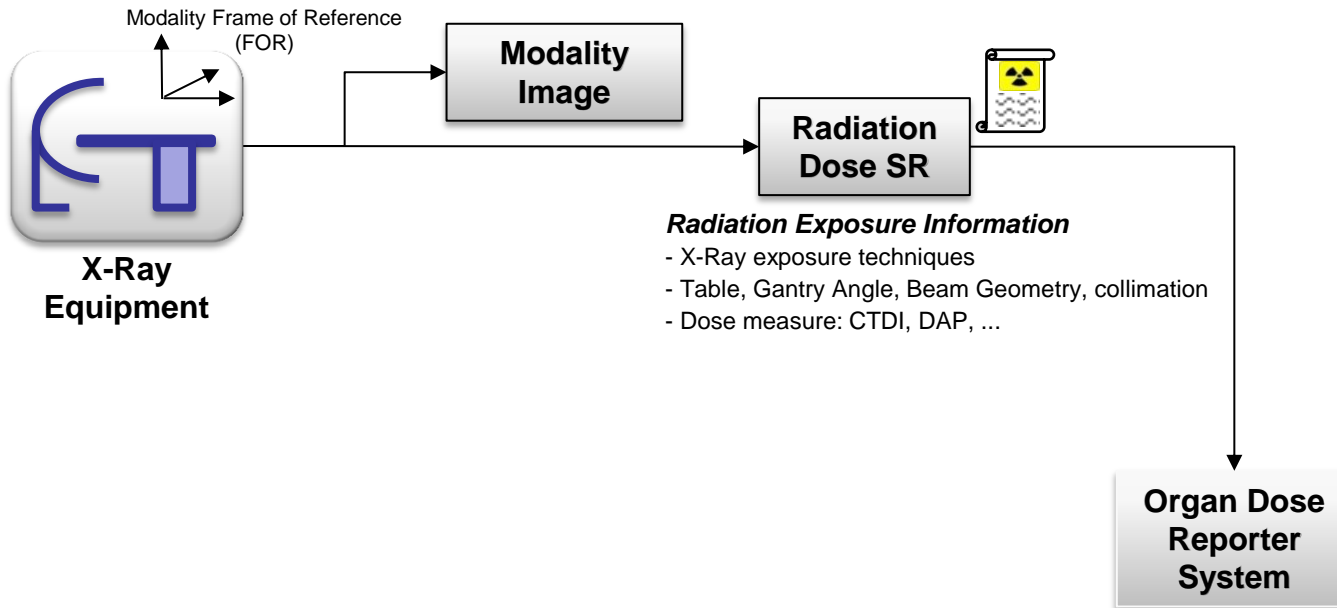


## Multiple RDSRs, multiple organs, multiple methods

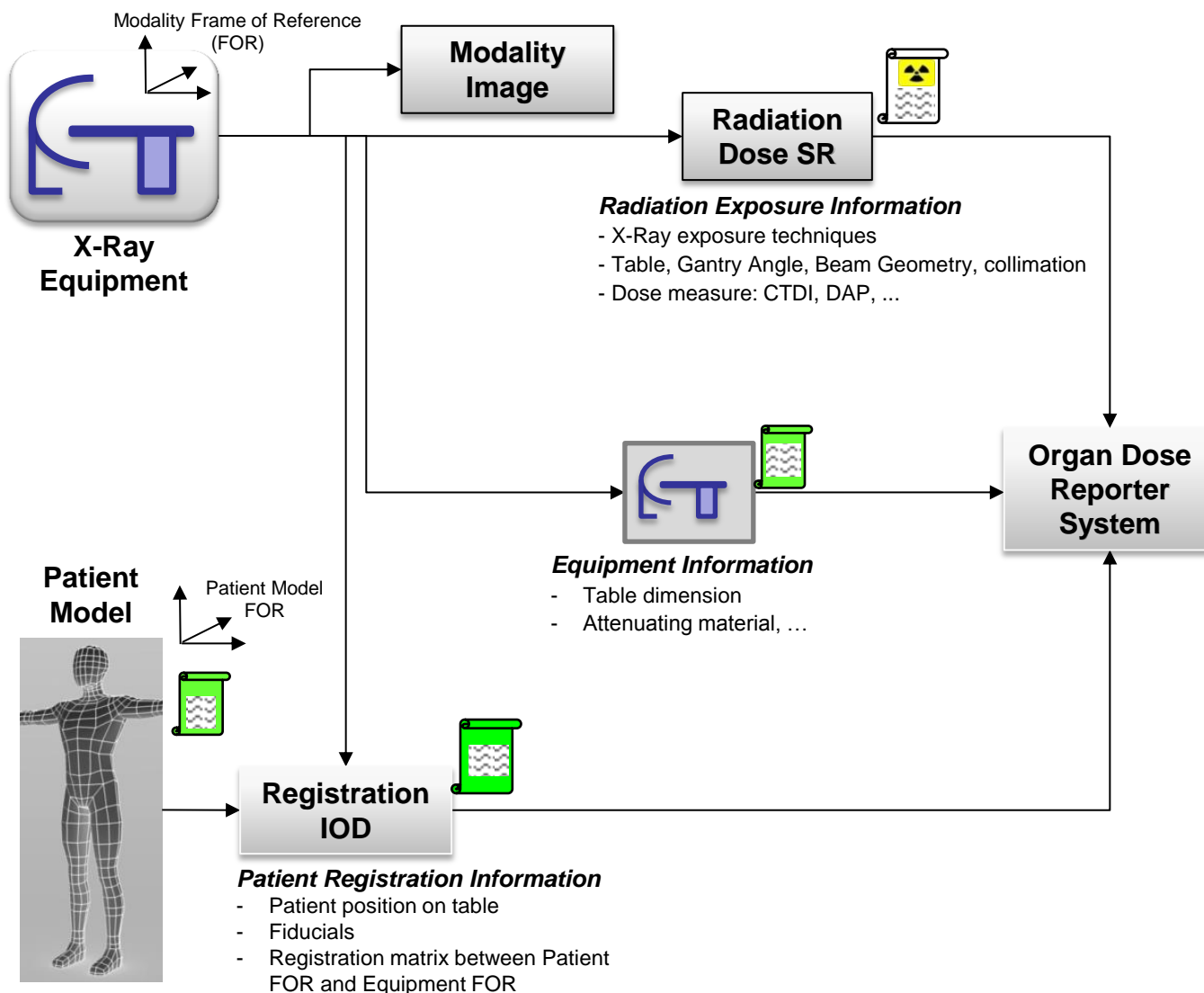




## Patient Dose Determination: Data Flow Requirements

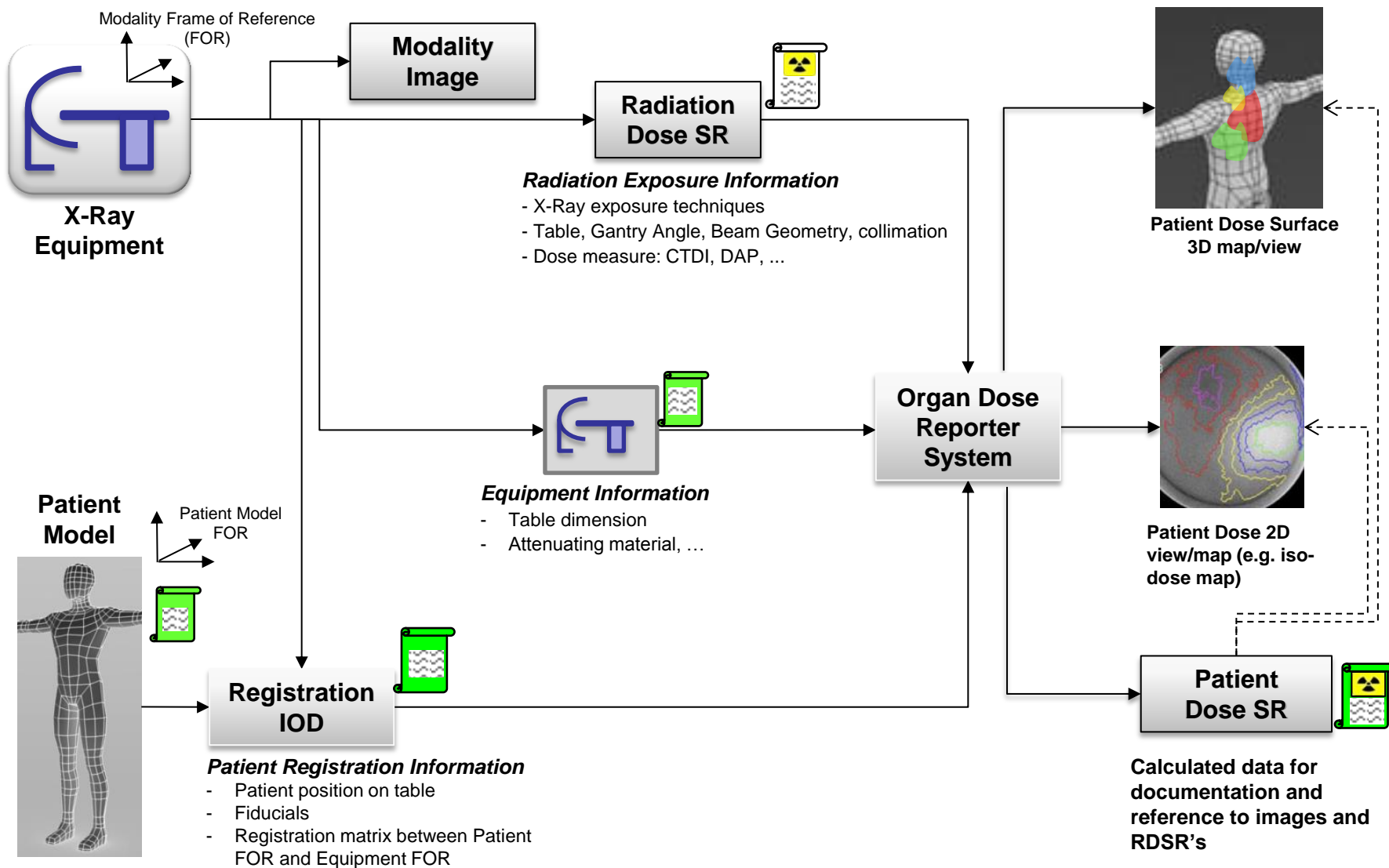


## Patient Dose Determination: Data Flow Requirements



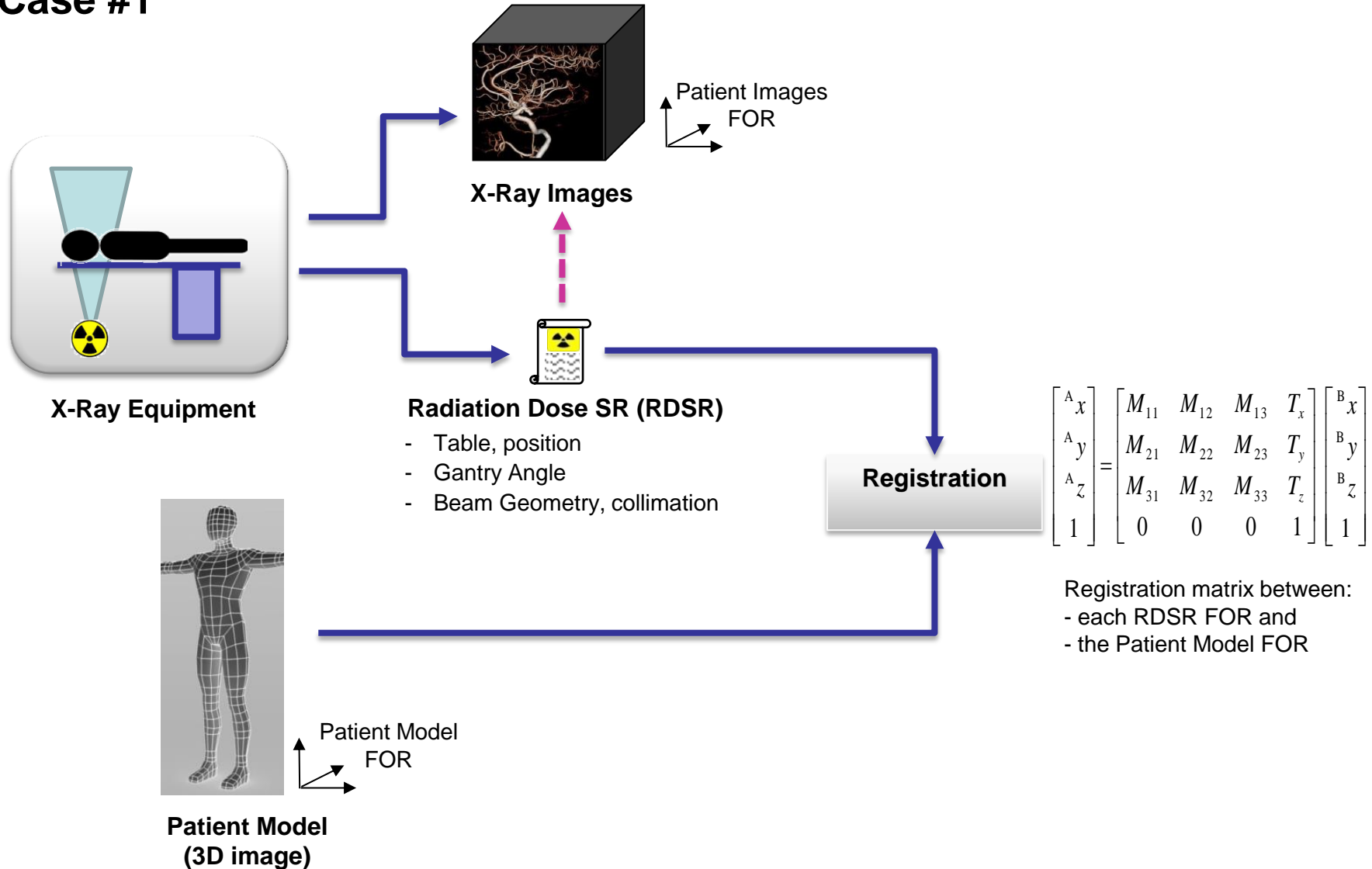
Signifies part of Supplement 191 Patient RDSR

## Patient Dose Determination: Data Flow Requirements



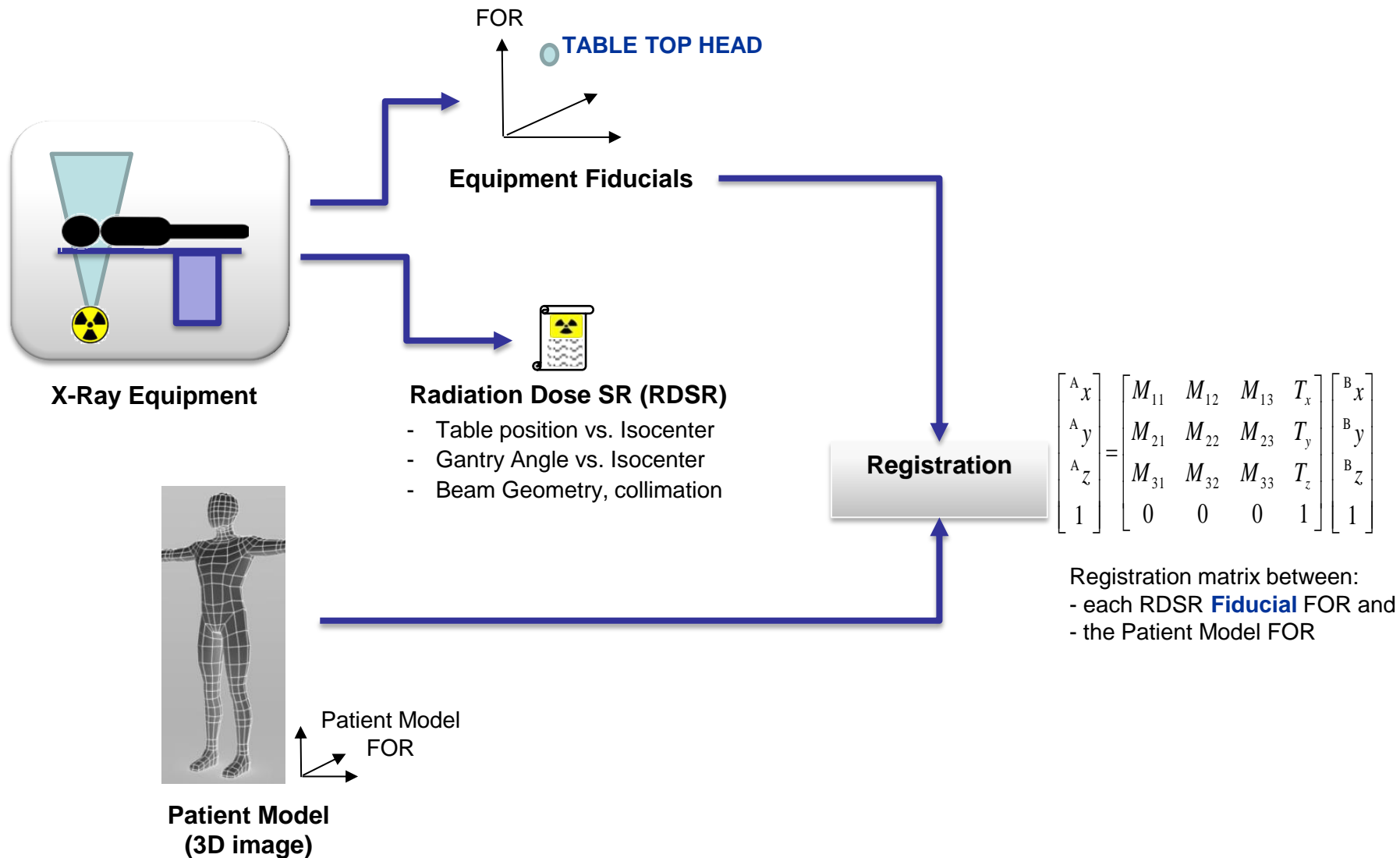
## Registration between Patient Model and RDSR

### Case #1



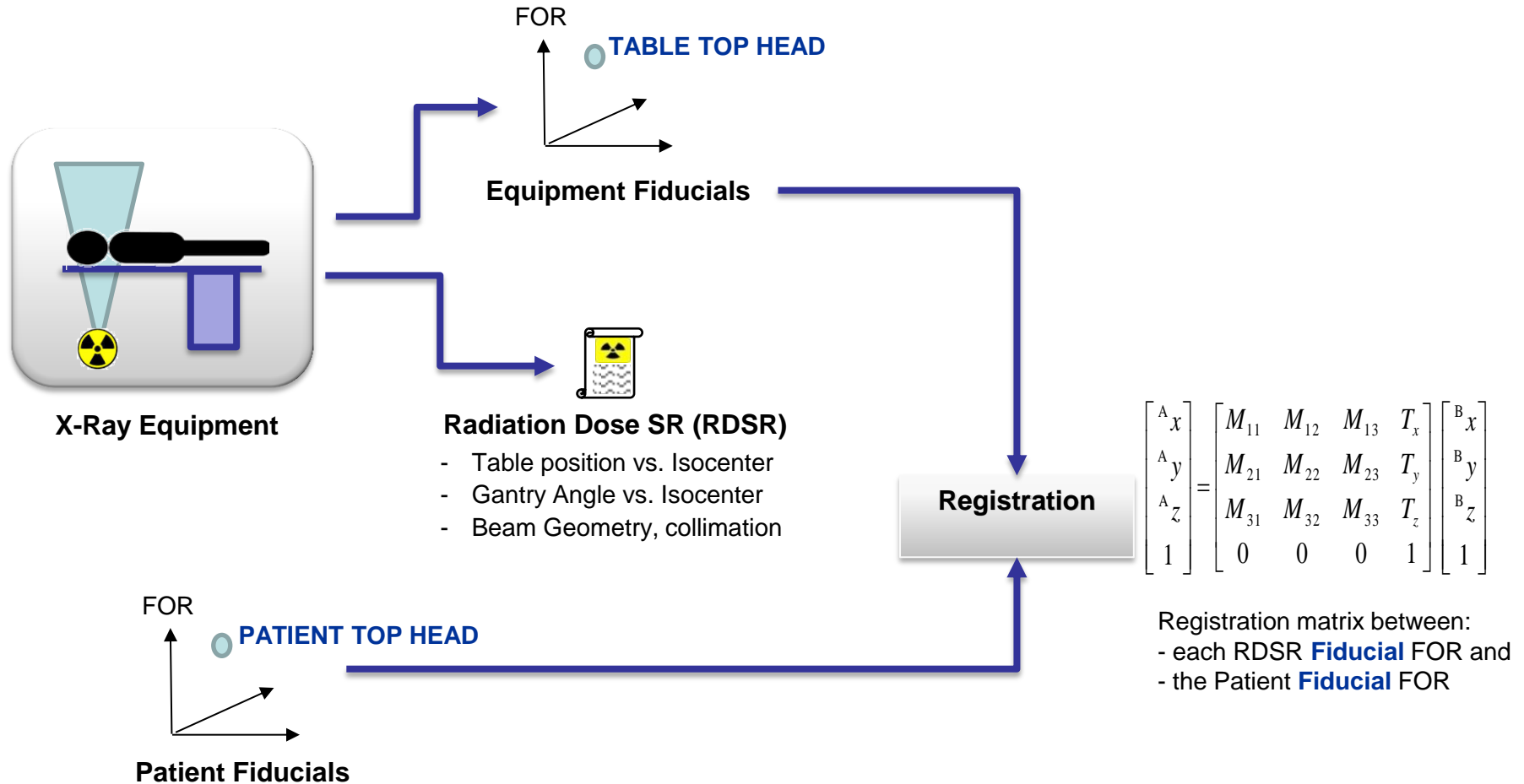
## Registration between Patient Model and RDSR

### Case #2



## Registration between Patient Model and RDSR

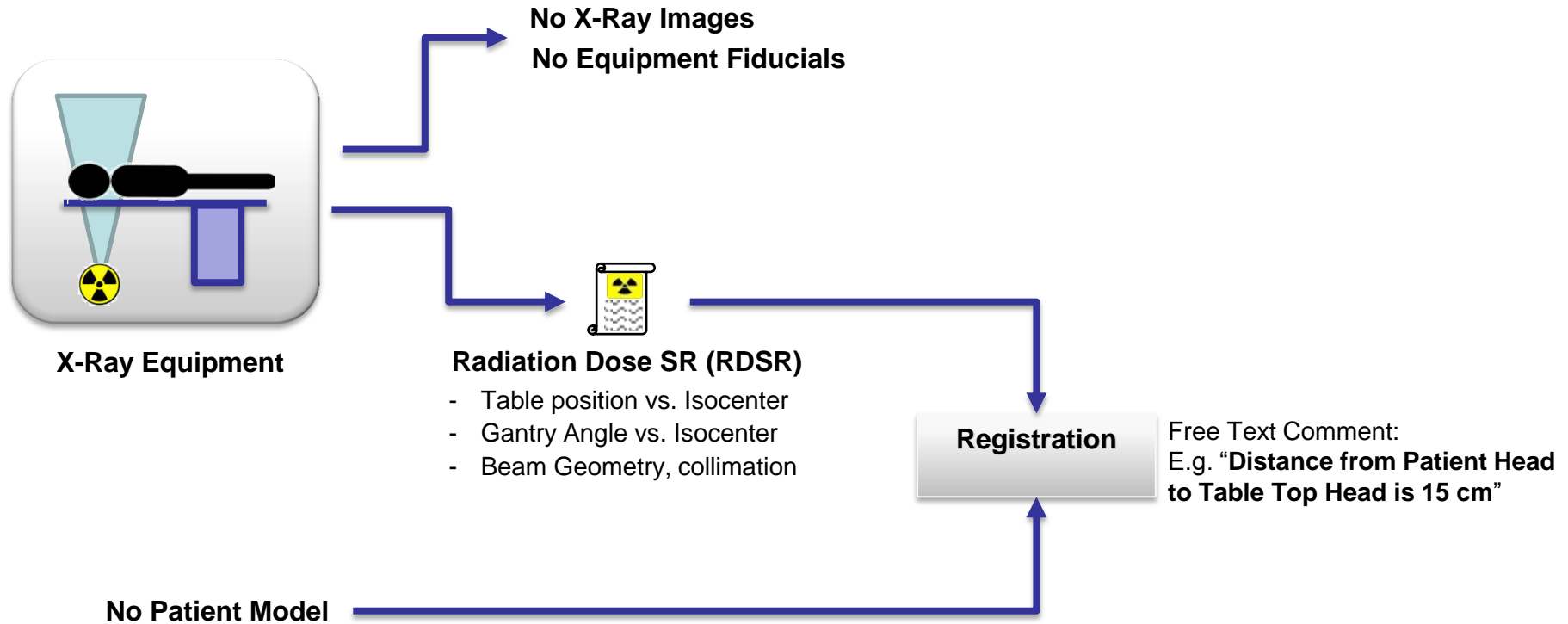
### Case #3



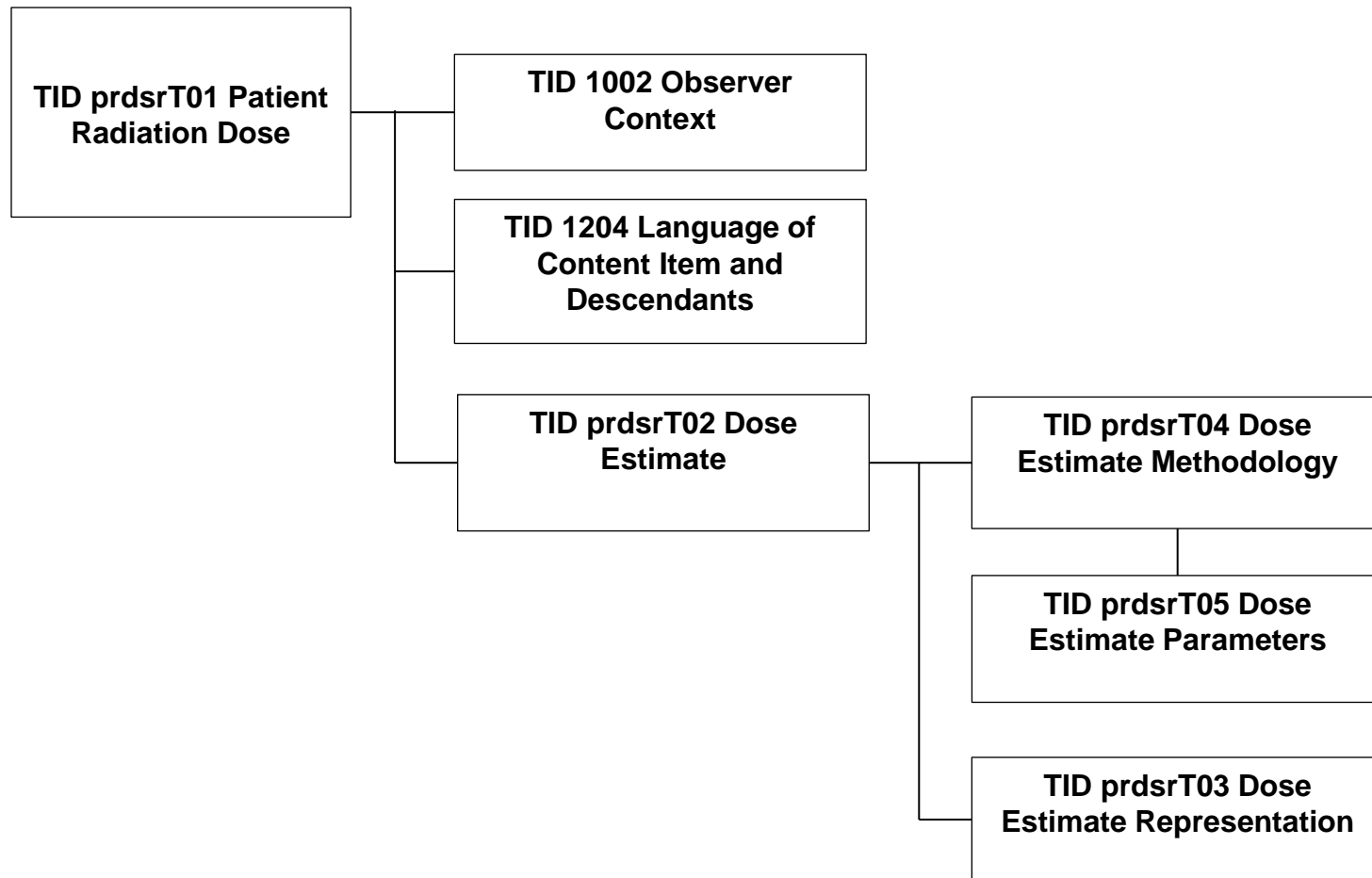
Note: the patient fiducials can be defined through a manual measurement on the actual patient landmarks, or through image-based measurements of landmarks visible on the X-Ray images.

## Registration between Patient Model and RDSR

### Case #4

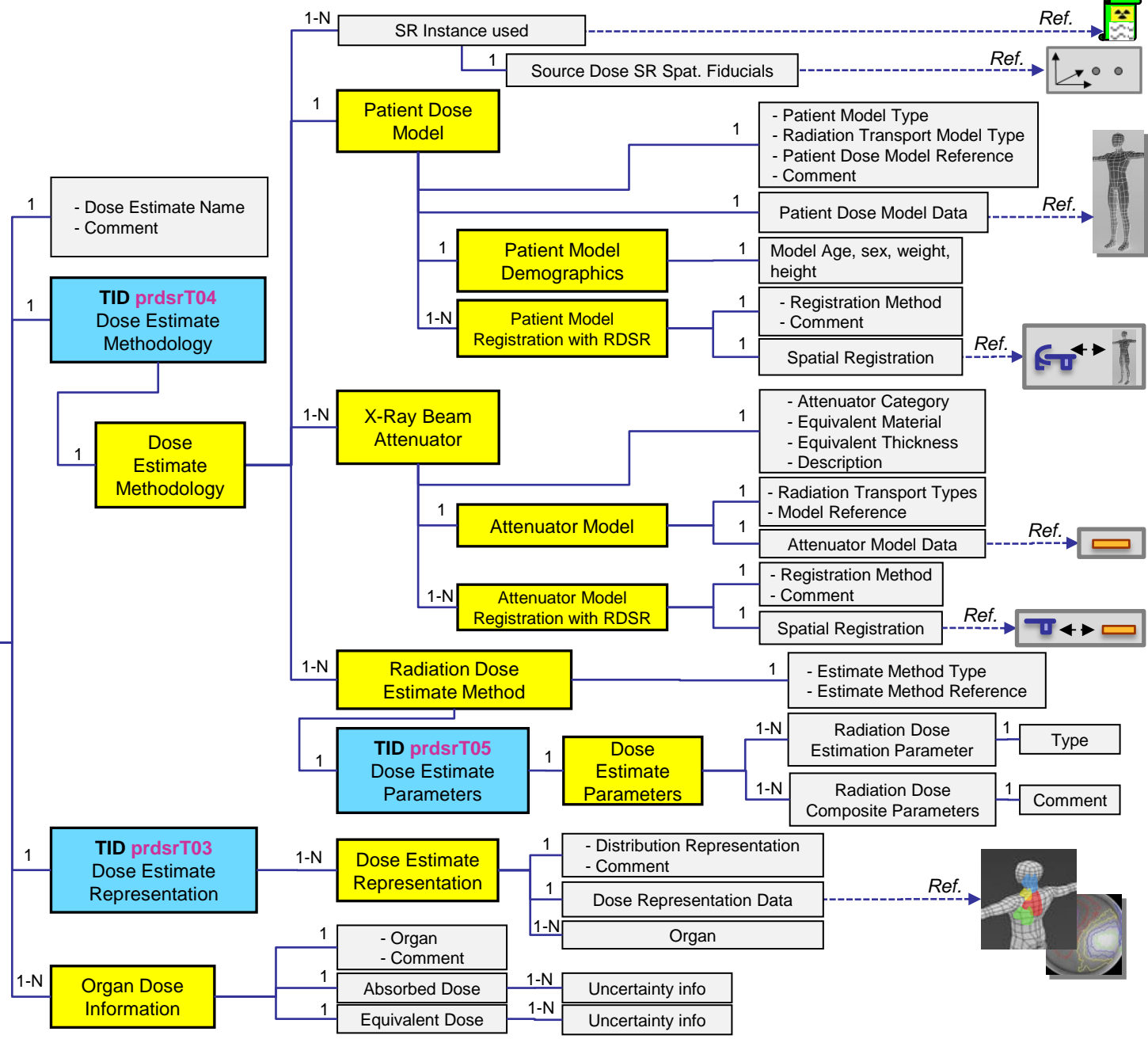
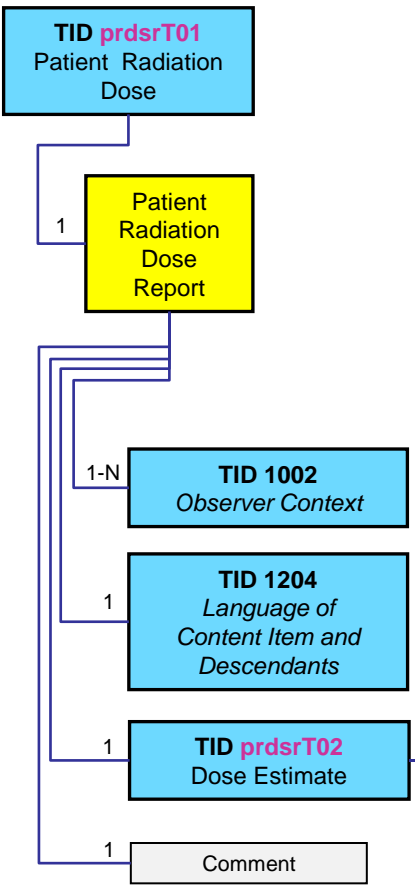


## Patient Dose SR IOD Templates





# Patient Radiation Dose SR: Detailed Structured Content



**Legend:**

- Template** (Blue box)
- Container** (Yellow box)
- Content Items** (Grey box)

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***Thank you for your attention!***