

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

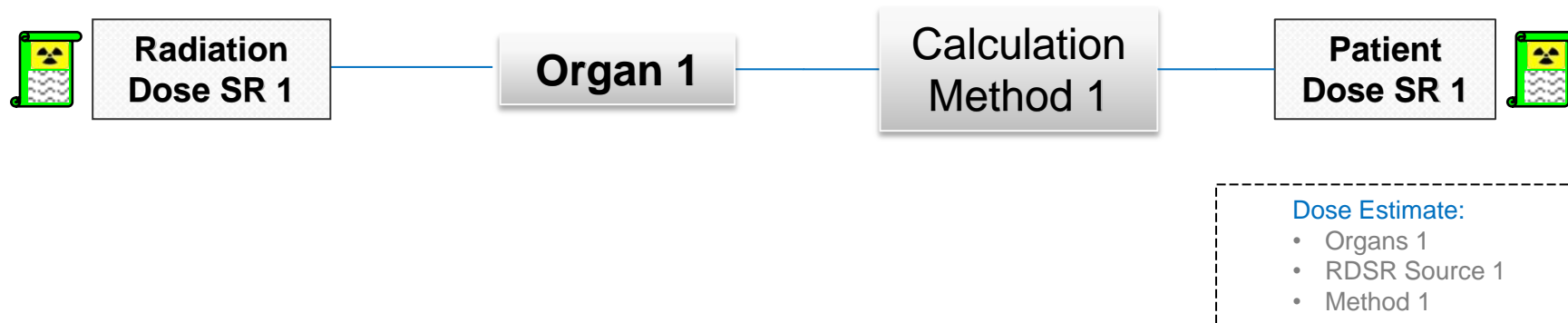
- **Multi-modality, single procedure step**

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

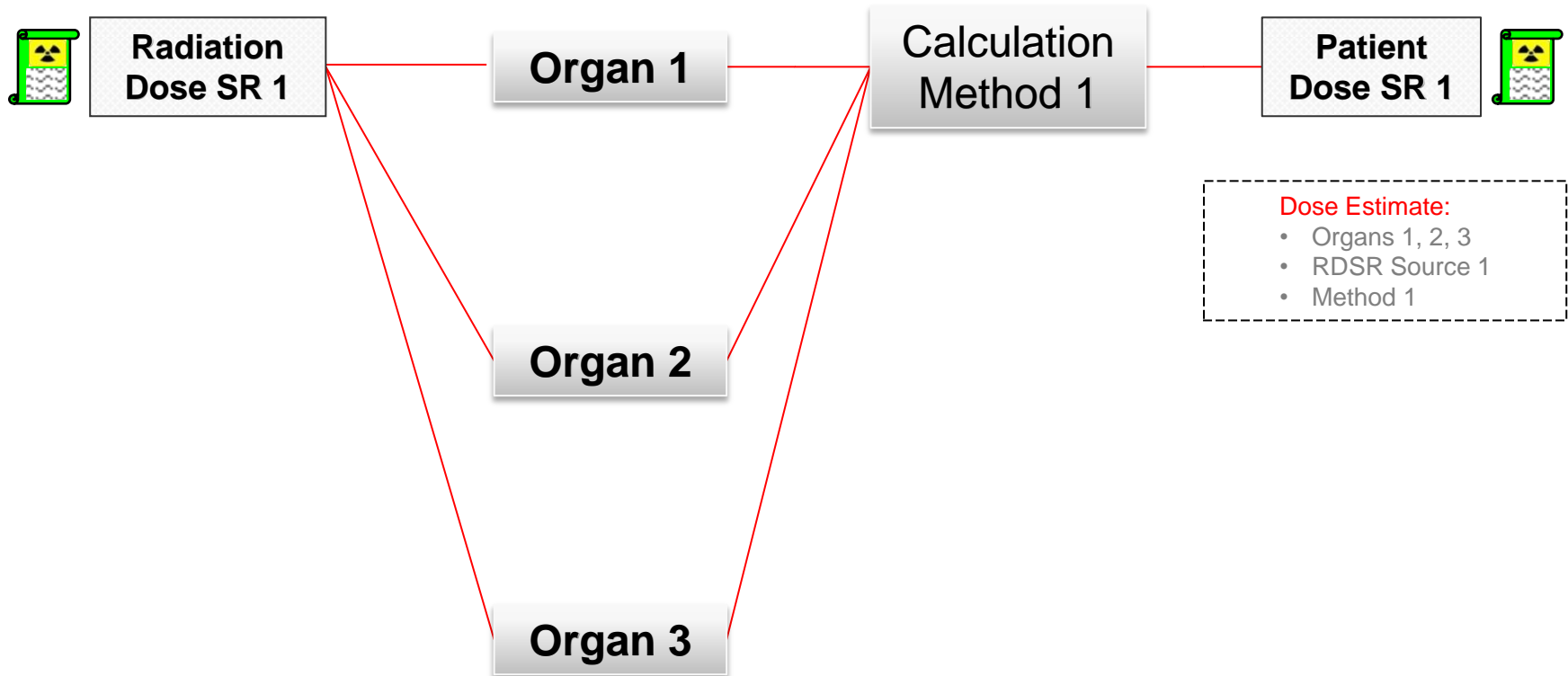
- **Single modality, multi-procedure step**

- **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

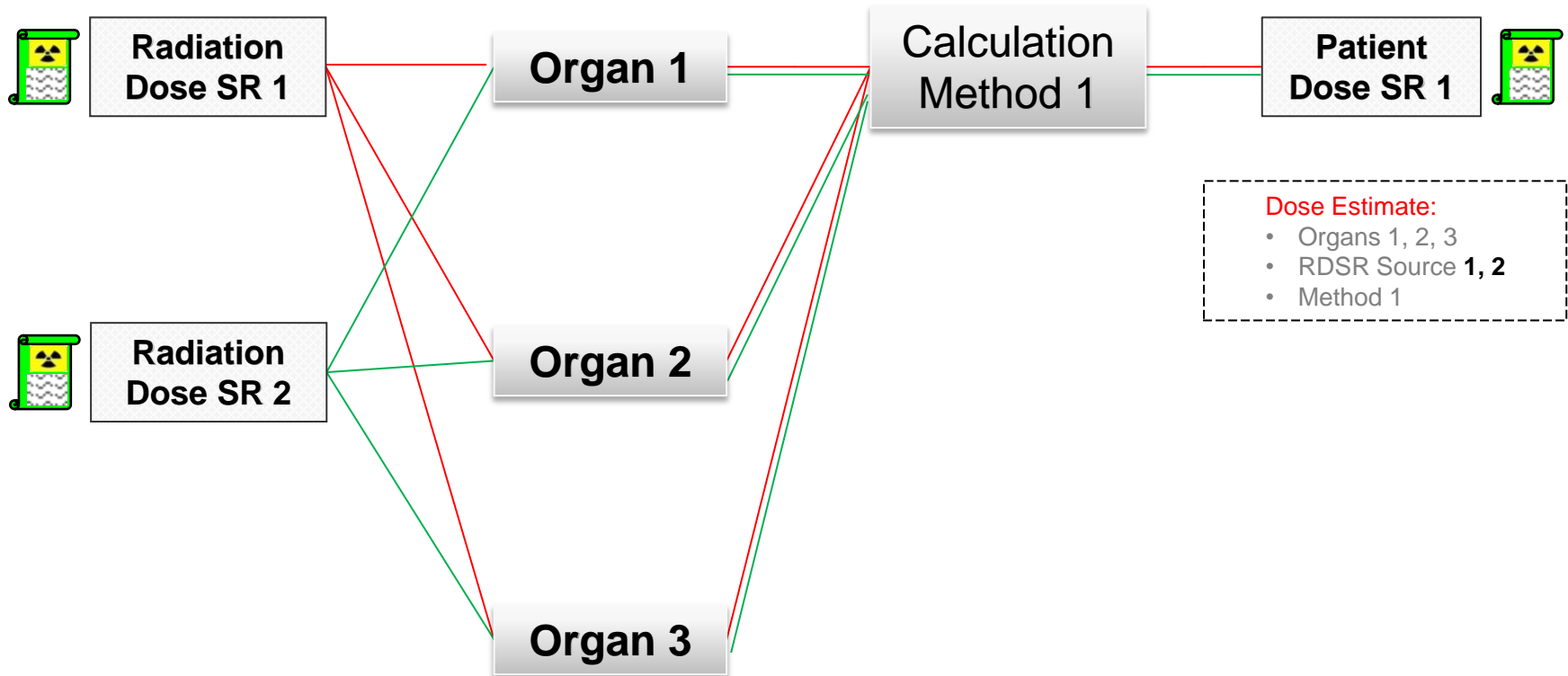
Data flow – simple case



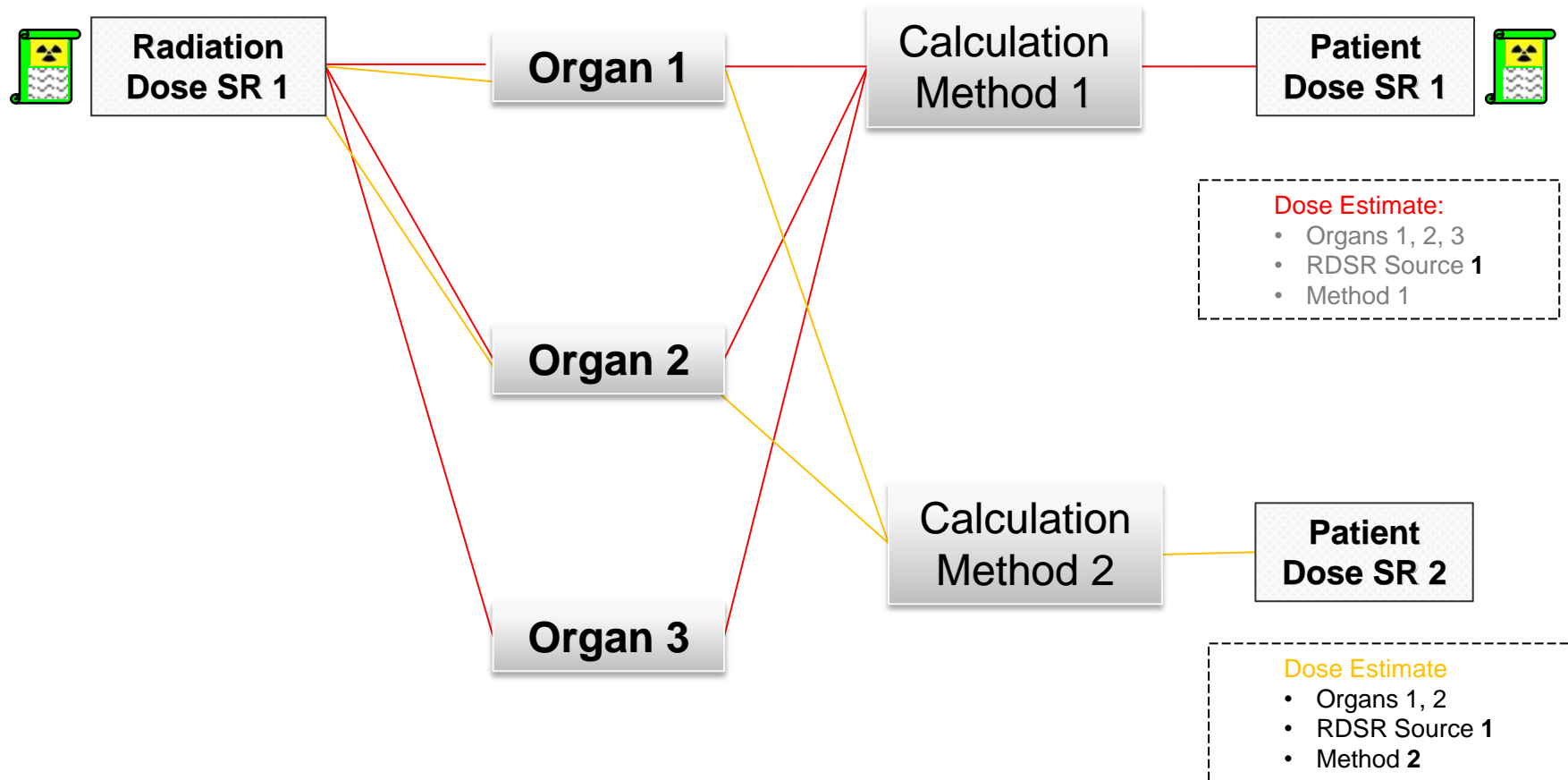
One RDSR, multiple organs



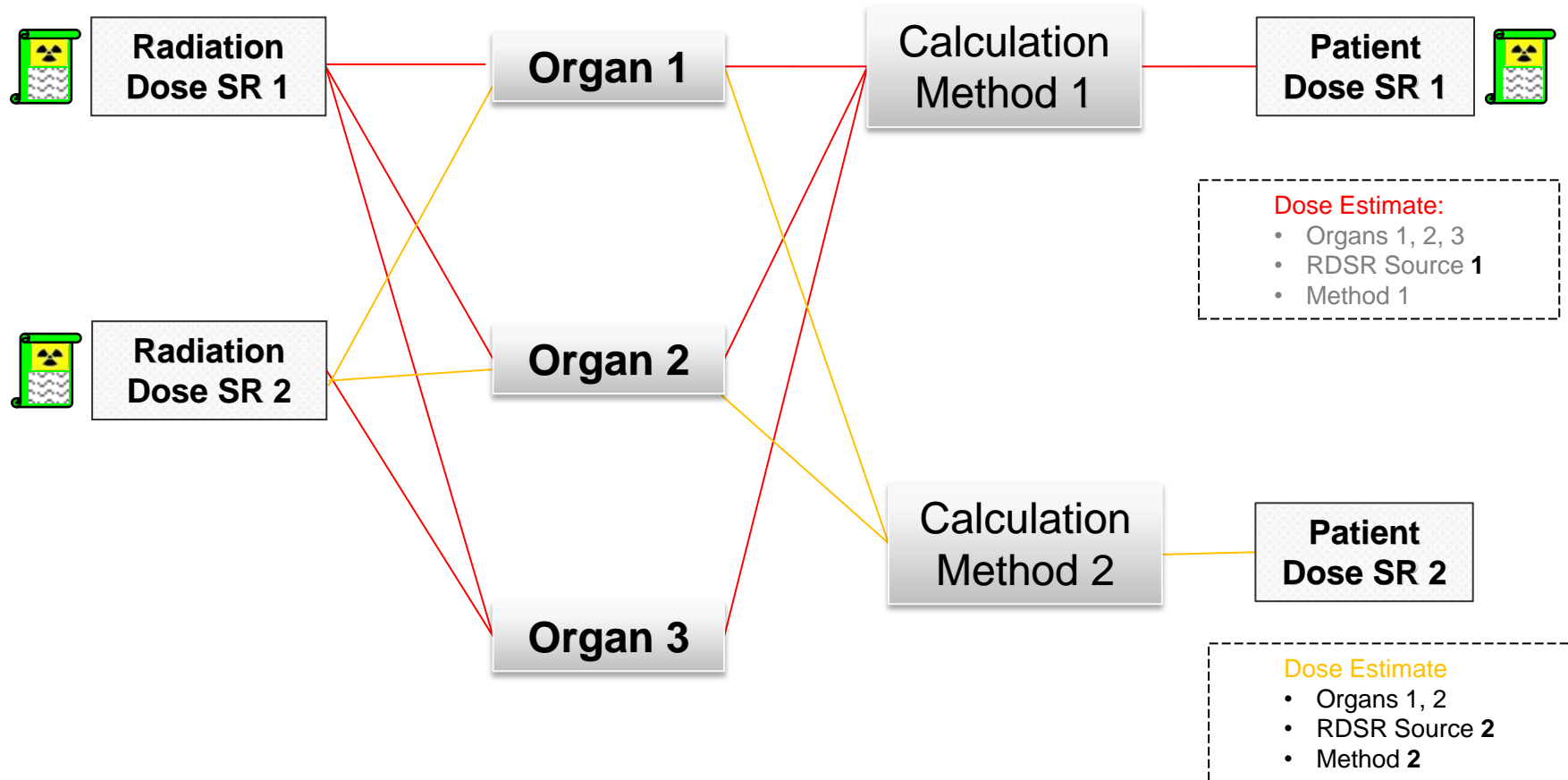
Multiple RDSRs, multiple organs



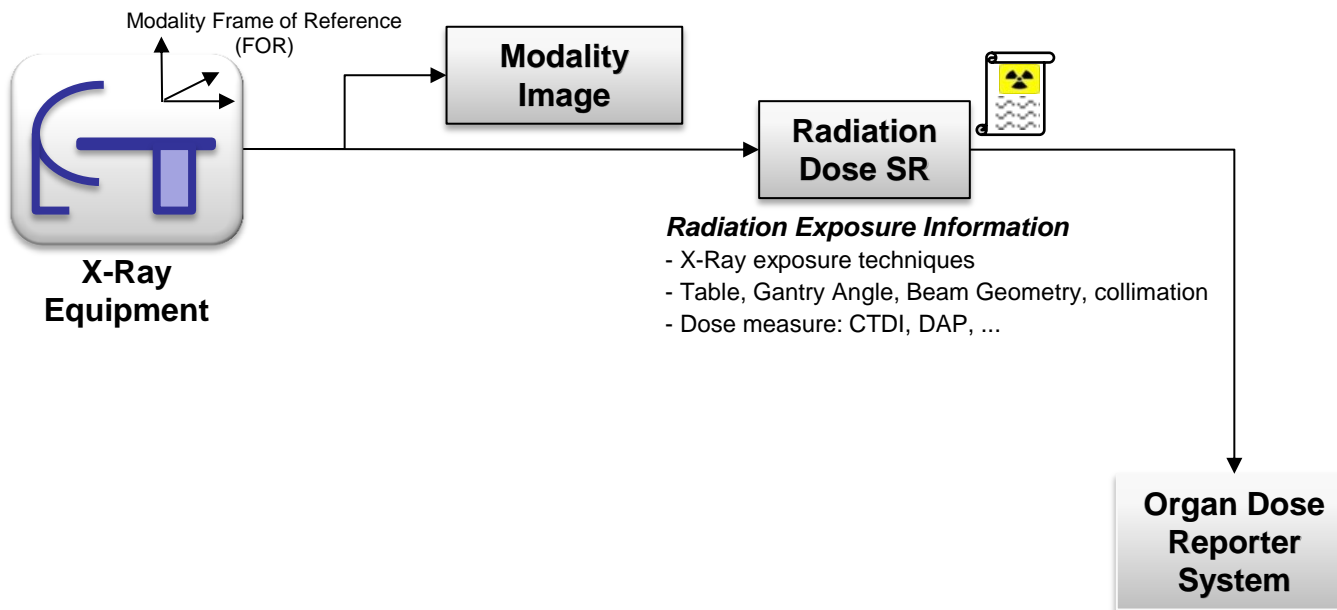
Multiple RDSRs, multiple organs, multiple methods



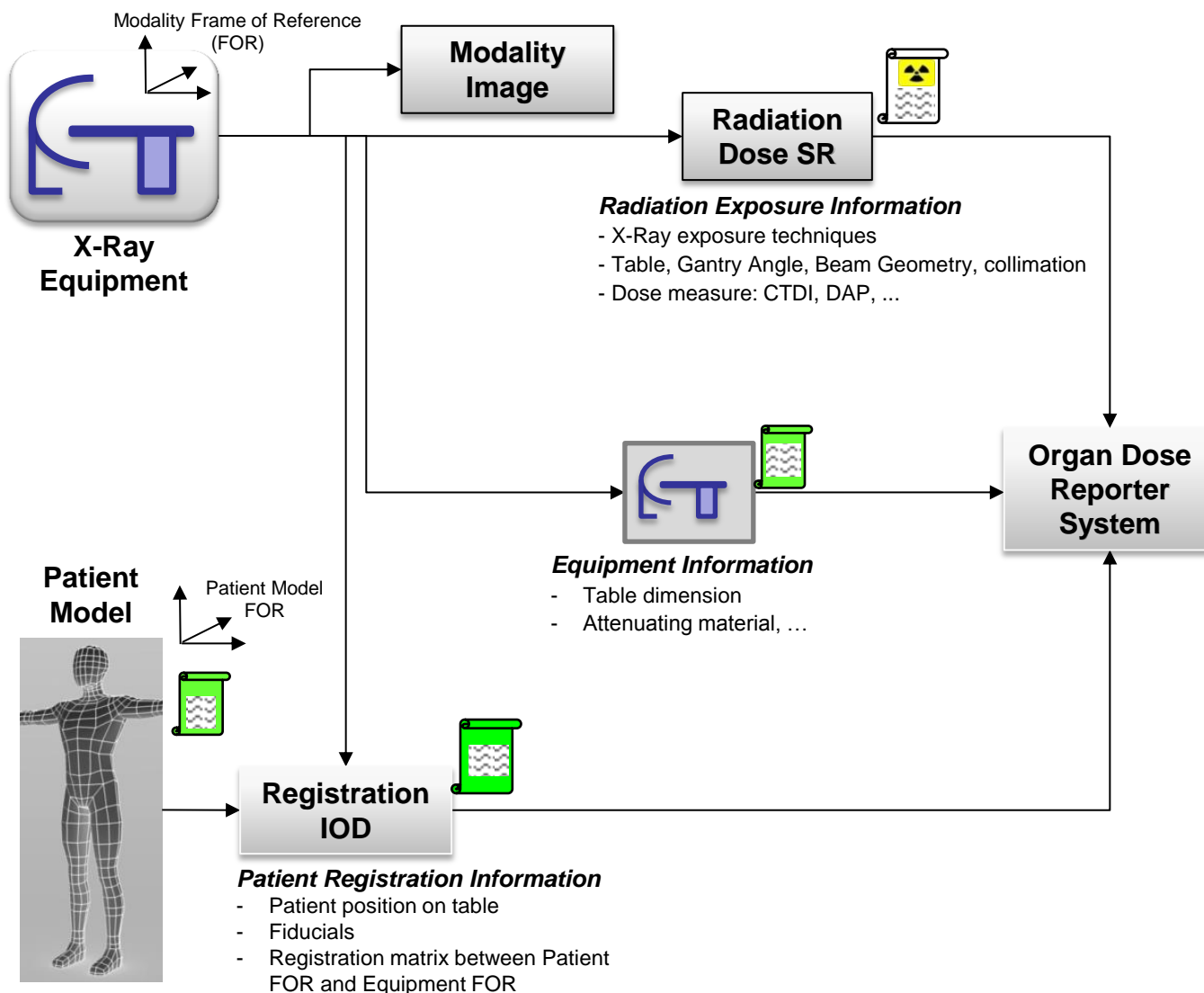
Multiple RDSRs, multiple organs, multiple methods



Patient Dose Determination: Data Flow Requirements

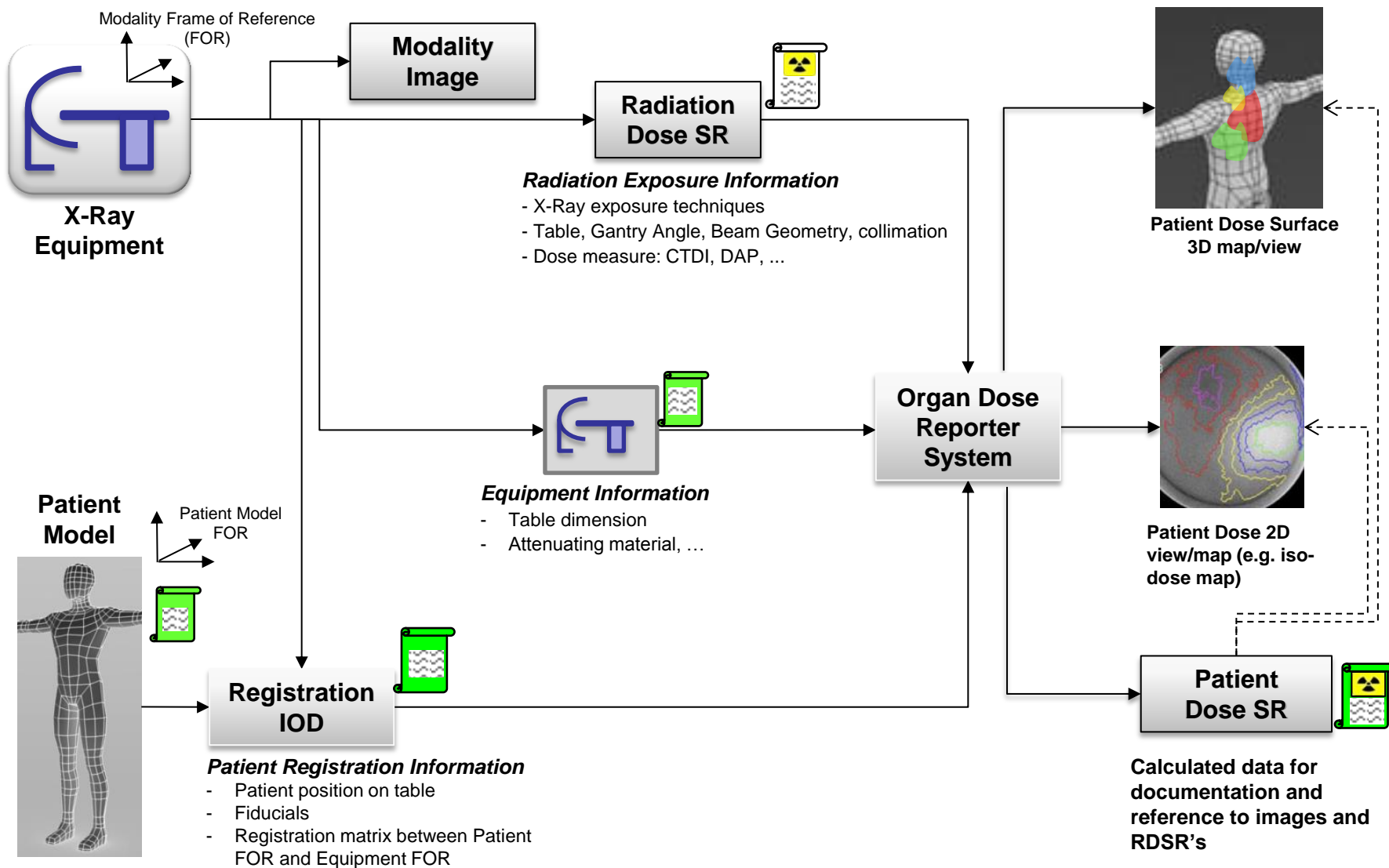


Patient Dose Determination: Data Flow Requirements



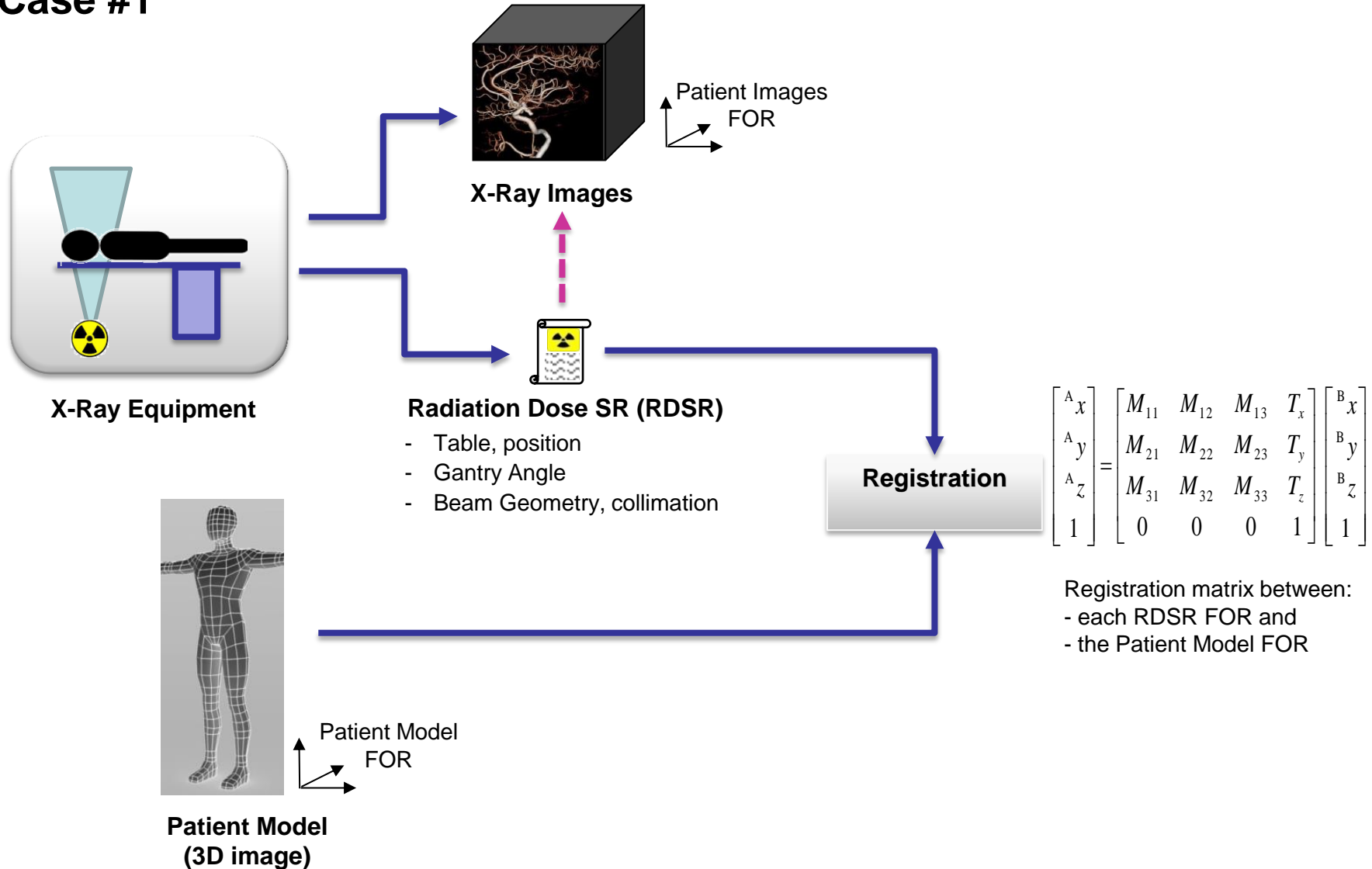
Signifies part of Supplement 191 Patient RDSR

Patient Dose Determination: Data Flow Requirements



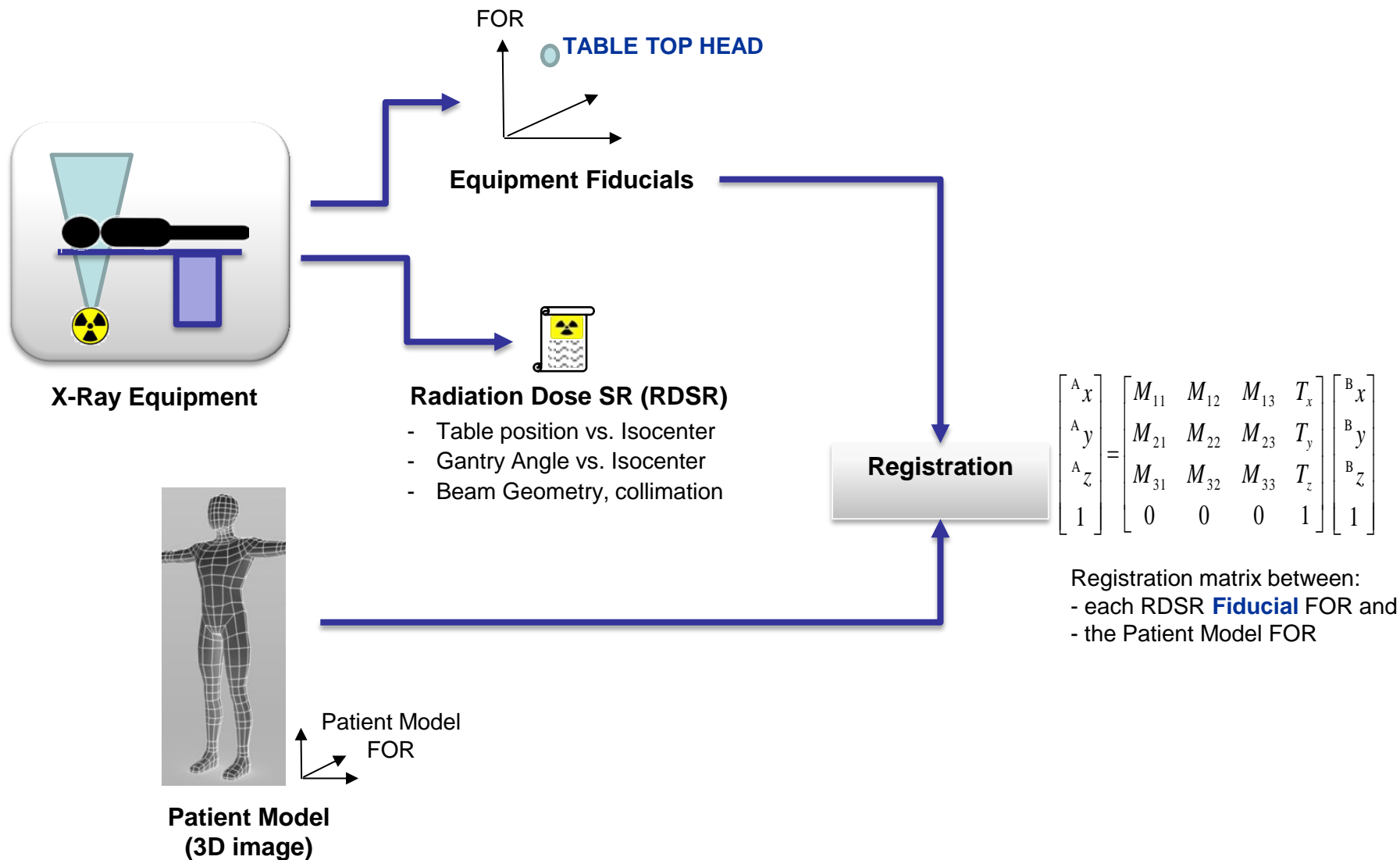
Registration between Patient Model and RDSR

Case #1



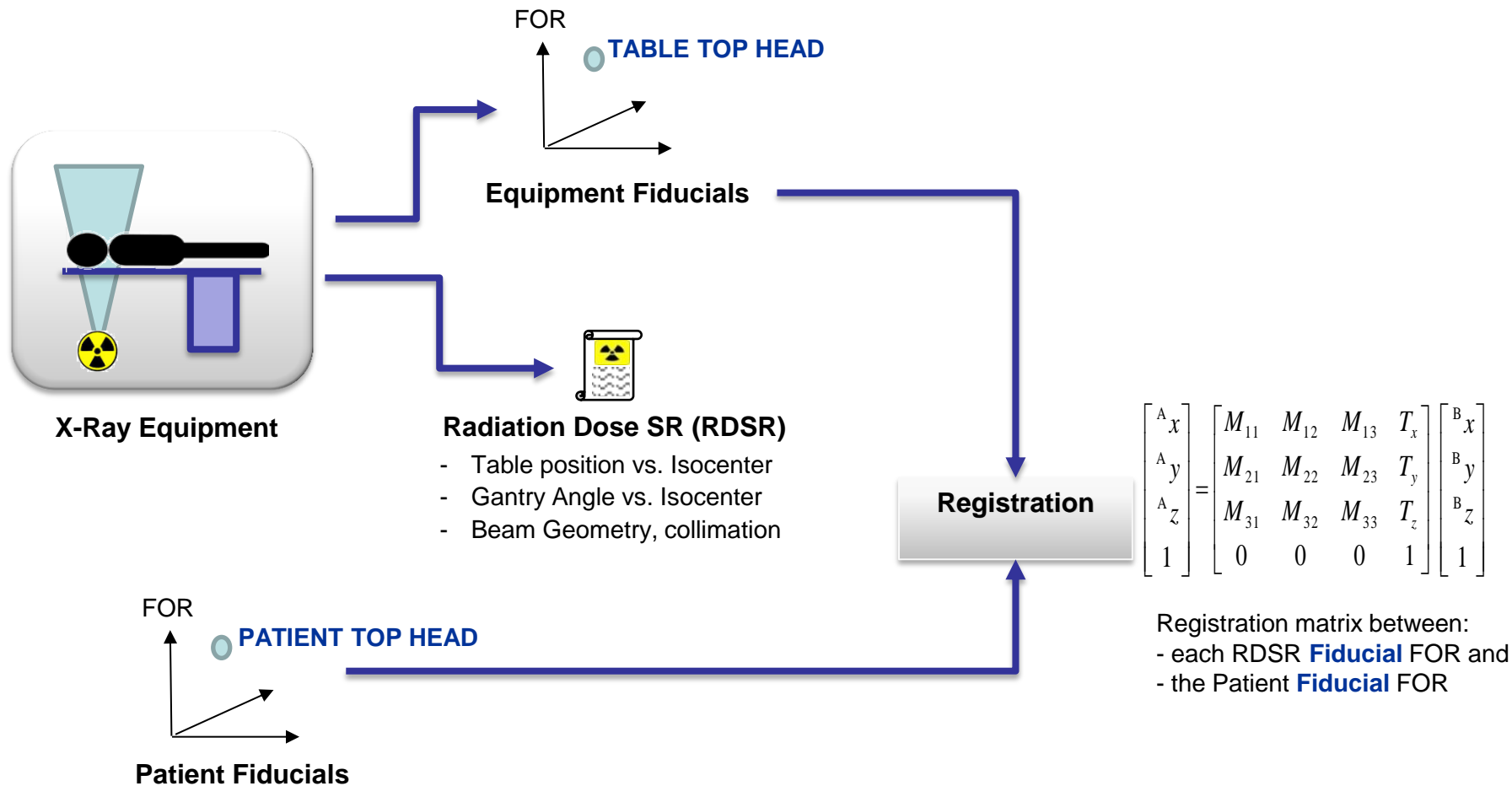
Registration between Patient Model and RDSR

Case #2



Registration between Patient Model and RDSR

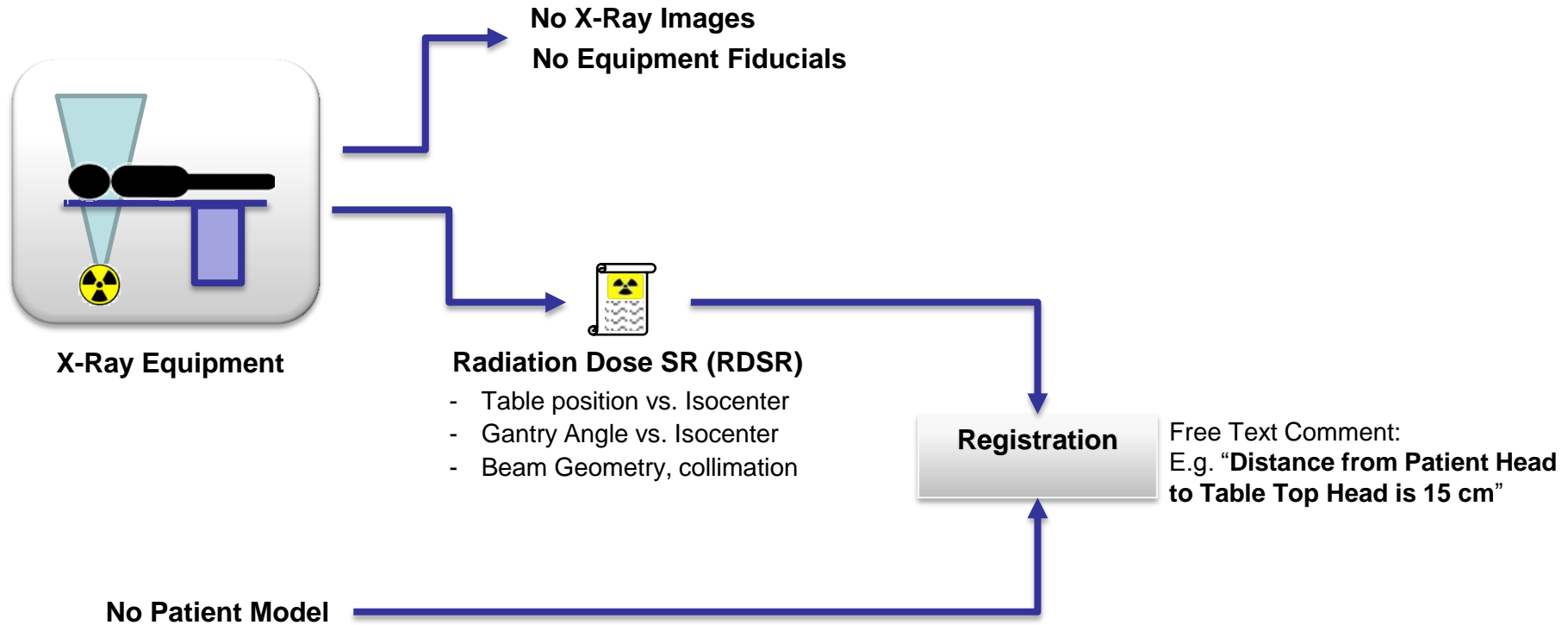
Case #3



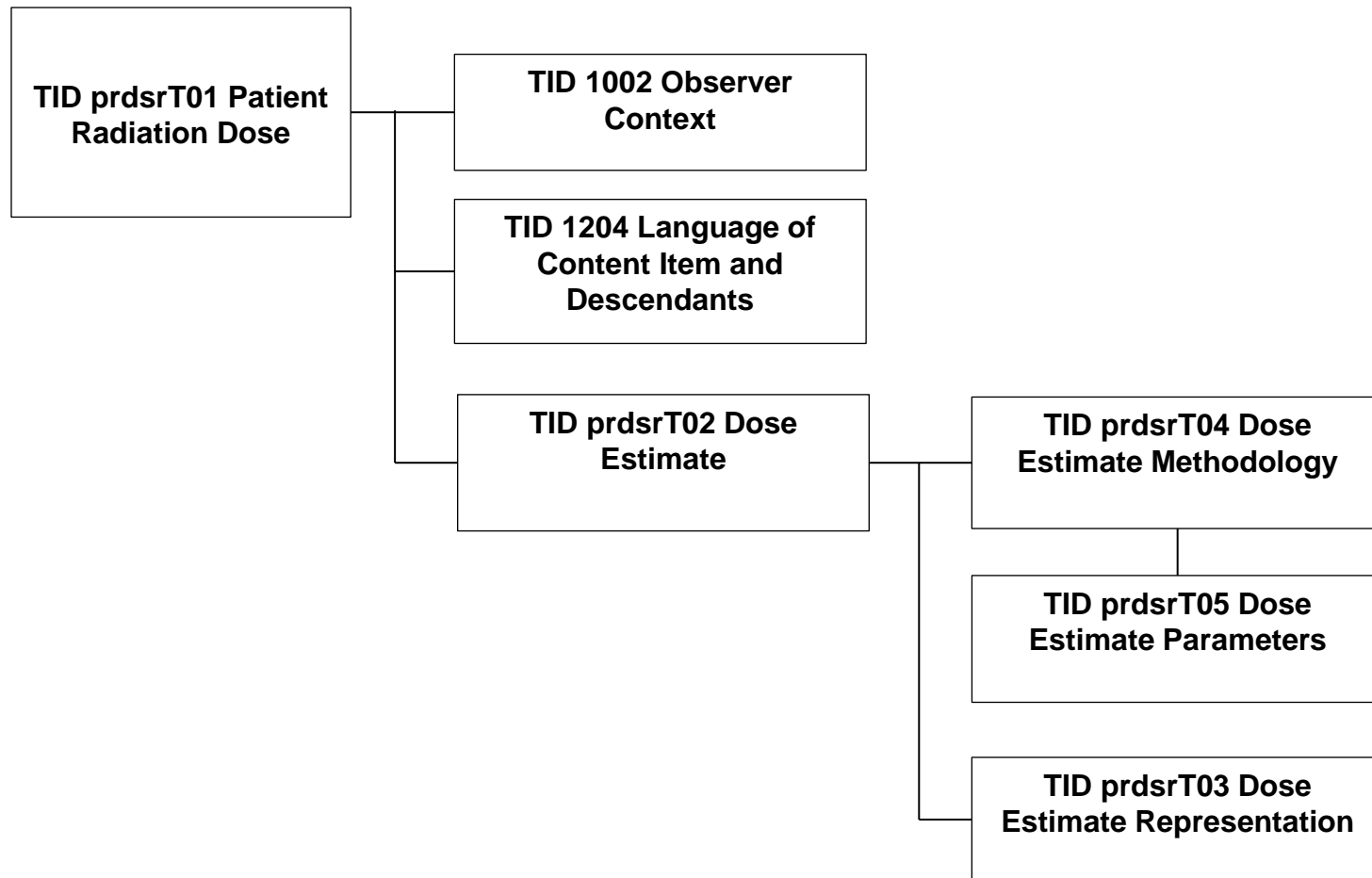
Note: the patient fiducials can be defined through a manual measurement on the actual patient landmarks, or through image-based measurements of landmarks visible on the X-Ray images.

Registration between Patient Model and RDSR

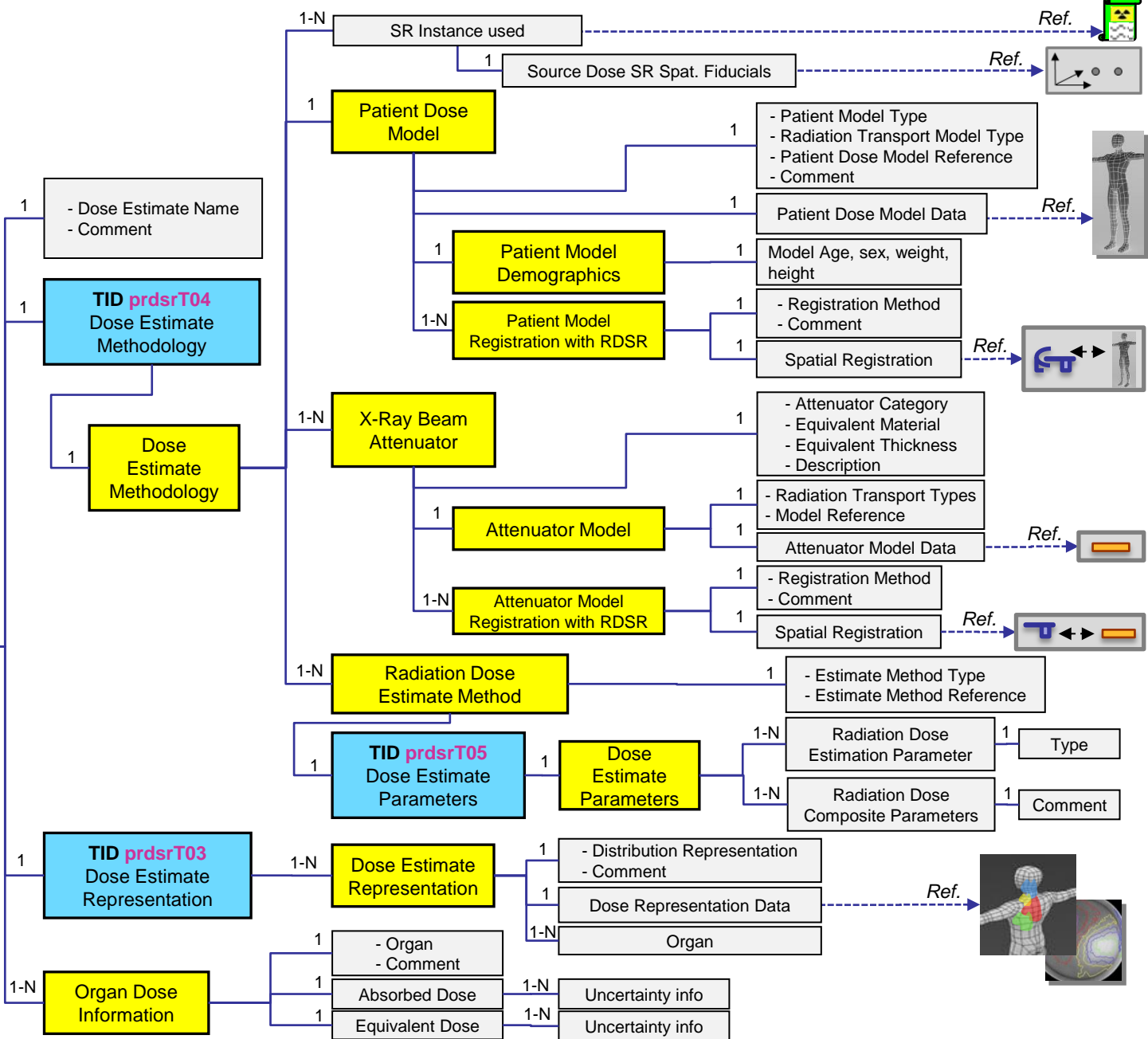
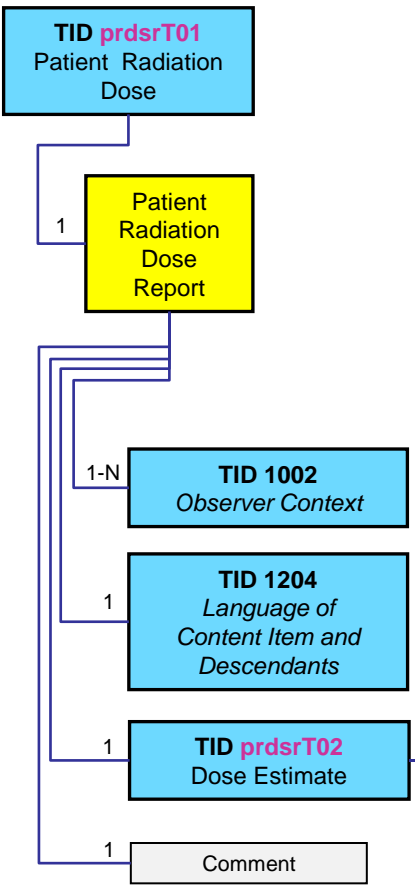
Case #4



Patient Dose SR IOD Templates



Patient Radiation Dose SR: Detailed Structured Content



Legend:

- Template
- Container
- Content Items

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Thank you for your attention!