





# Instructions for Use

## Astroid Patient Data Model

The following page describes the hierarchy of data used to manage patient data records within the Astroid planning environment.

## Hierarchy

- Patient
  - Course [0,1,...,N]
    - Course data stuff here 
    - Intent [0,1,...,N]
      - Intent data stuff here 
      - Directive [0,1,...,N]
        - Clinical Goals
          - Clinical Goals data stuff here 
          - Prescriptions
            - Prescription data stuff here 
            - Directive Structure List [0,1,...,N]
            - Directive Point List [0,1,...,N]
            - Patient Model [0,1,...,N]
              - Imaging Data
              - Structure Data [0,1,...,N]
                - Active Variant
                - A specific model of a target, OAR, or other structure. A physician may provide an initial target contour and a treatment plan generated using this information. The physician may later (using the same CT image set) provide a revised target contour. Rather than import this revision as a new structure or override the original, you may specify this new contour as a variant of the original. Each contour may have only a single “active” variant and the plan will automatically update based on the selection of the active variant. However, in some cases it is not desirable to update the plan, so the user may also choose to lock the plan and simply recompute DVH and other volume based statistics based on the new active variant geometry. In either case, variants can be used to streamline

- workflows and prevent accidental misuse of out-dated contours.
- Variant List [0,1,...,N]
- Plans [0,1,...,N]
  - RSP Data
  - Points [0,1,...,N]
  - Structures [0,1,...,N]
  - Calculation Grid
  - Treatment Room
  - Beams [1,...,N]
    - Snout
    - Devices & Spot Options
    - DRRs
  - Fraction Groups [1,...,N]
    - Target
    - Constraint [0,1,...,N]
    - Target Dose Constraints [1,...,N]
      - Target
      - Constraint [0,1,...,N]
      - Beamset [1,...,N]
        - Constraint [0,1,...,N]
        - Beam [1,...,N]
  - Constraints [0,1,...,N]
  - Objectives [0,1,...,N]
  - Dose Results

## Descriptions

- **Patient:**
  - A person receiving medical treatment. A Patient record contains basic personal information and demographics, as well as any number of treatment Courses.
  - This is where the patient name (prefix, given name, middle name, family name, suffix), medical record number (MRN#), sex (male, female, other, any) and date of birth (month, day, year) are stored.
- **Course:**
  - A prescribed regimen to be followed to treat a specific disease occurrence for a specific period of time. A Course will contain the physician's Intent and Directive information
  - The user will label the Course of treatment and specify the physician of record. The user has the option of adding a description of the course of treatment.
  - The intent captures the physician's purpose for this Course of radiation treatment. An Intent contains information about any protocols this patient is under, as well information regarding the disease site, body system, and body part (for both templating and billing purposes). An Intent can contain any number of Directives (although it's uncommon to have more than one). The user will define the type of treatment (curative, palliative, or prophylactic), as well as the treatment site at this level. A narrative of what the physician desires to achieve as a result of the course is also saved here.

- The directive is the physician's orders for treating this Course. A Directive contains information about the prescription and other clinical goals for the Course.
- A Course also contains any number of Patient Models.
- **Patient Model:**
  - A description of the patient's anatomy. Contains a single CT image set and all contour variants (targets and organs at risk) associated with these images. A Patient Models can contain any number of associated Plans.
  - **Variant:**
    - A specific model of a target, OAR, or other structure. A physician may provide an initial target contour and a treatment plan generated using this information. The physician may later (using the same CT image set) provide a revised target contour. Rather than import this revision as a new structure or override the original, you may specify this new contour as a variant of the original. Each contour may have only a single "active" variant and the plan will automatically update based on the selection of the active variant. However, in some cases it is not desirable to update the plan, so the user may also choose to lock the plan and simply recompute DVH and other volume based statistics based on the new active variant geometry. In either case, variants can be used to streamline workflows and prevent accidental misuse of out-dated contours.
- **Plan:**
  - A detailed model of a proton therapy treatment. Most aspects of the patient planning information are stored here (e.g. Beams, Fraction Groups, Optimization Information, and Dose Results). A Plan will specify the portion of the Prescription it should meet and physicians will publish (approve) a Plan to indicate it is ready to proceed to QA and (if successful) on to actual patient treatment. There should be only one "published" Plan per Prescription.

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