# Use cases for Accel-RT databases

Actor: Data Feed

Role: Automated or batch transfer of image and clinical treatment data from treatment planning system, PACS, RIS or OIS into Accel-RT object packager.

Use case : Scheduled task to receive data digests from clinical data systems and export packaged data via SFTP / web push

Quid-pro-quo: N/A

Actor: Radiation oncology expert

Role: The Expert will have already identified a prepared clinical case which would be relevant for inclusion into the Accel-RT database. They would have details of the desired treatment doses which would normally be entered into a planning form, to start a dialogue with physics to create an appropriate treatment plan.

Use Case: The Expert will want to identify their patient on the system and enter relevant data about the **intent of radiotherapy treatment to target and normal tissue structures directly into a database form.** The system captures the essence of the intent of the treating expert.

Quid-pro-quo: The system would produce the planning form electronically, rather than having to be written out. The system offers the opportunity to encode treatment intent, and to turn the planning resource created by the expert into a teaching resource.

Actor: Physicist

Role: The physicist is in charge of producing the best plan that satisfies the dose constraints specified by the expert. This might be achieved in a single plan, or may require a range of plans that effectively implement different compromises to the unfulfilled dose constraints All this data can be ingested by the Accel-RT database

Use Case: The physicist will want to identify the patient on the system, and ideally have an automated way to take dose statistics from the plan they have just generated and associate it with a particular course of treatment.

Quid-pro-quo: Currently, physicists have no way to get back to a previous instance of a planning case, unless they can remember the name of the associated patient. The database would provide a wealth of search terms to facilitate recall of previous treatment planning episodes (switching from Physicist to researcher)

Actor: Radiographer

Role: The radiographer is responsible for delivering treatment accurately on each day of a course of treatment. The image guided radiotherapy machines will take an image of the patient prior to treatment, in order to ascertain if the tumour target has moved. If necessary, a corrective shift is made to counter this move and keep the tumour target in the correct position.

Use case: Currently these shifts are entered into a web-based database run by Andrew Hoole. We would want a way for it to be entered directly into Accel-RT, either directly via a form, or by capturing the data from Andrew’s existing database. If this is the case, then the role of the radiographer for the Accel-RT database is to indicate that treatment is complete, and thus invoke processes that would collect the shift data.

Quid-pro-quo: Hard to say really, except that our Rads are familiar with the need to collect shift data so we can determine just how accurately we deliver treatment.

Actor : Researcher

Role: The researcher has a new treatment scenario, and wants to gain experience from the database to identify similar cases that have been treated in the past. The idea is that prior treatment instances available in Accel-RT would help the researcher to decide on a plan of treatment for a specific patient, or perhaps even assess impact of a new treatment technology against ‘historical best practice’.

Use case: This is all about granular search terms, either using text base terms, by feeding in an annotated image and letting the database search for similar cases. Text based searches would run something like “show me all plans where the thyroid gland received more than 40Gy maximum dose”, or “Find an example of a female patient receiving pelvic radiotherapy for sarcoma”.

In the image based search, the image would have to be parsed to determine an anatomical region (head, neck, thorax, abdomen, pelvis, extremity) and the regions of interest from the annotated image would be searched for matching entries in the database.

Quid-pro-quo: The researcher gets to research!