The purpose of this document is to describe the data transfer process and the data migrated from IMPAC Multi-ACCESS™/Elekta MOSAIQ®/Siemens LANTIS™ (third-party database) to the ARIA® oncology information system. Data transfer from the third-party database to ARIA Level Three allows customers to have existing pertinent data from a single database migrated to a new or existing single Varian System database. The document identifies considerations/limitations of the process and is broken out in sections based on the following:

- Sequence for data transfer
- Important customer considerations
- Data transfer technique
- Data fields to be transferred

**Process for Data Transfer**

The migration process requires a substantial time commitment (18 – 20 weeks minimum) for both the Varian migration analyst and the client. It is highly recommended that the client provide one person (preferably with clinical, decision-making ability) to act as a point of contact for the migration analyst. This person must be able to perform and/or delegate client-side tasks necessary to the migration process.

The migration process is performed remotely using the SmartConnect® solution. The customer should ensure that Varian can install SmartConnect® on the T-Box and ARIA production server in order to remotely access both test and production environments.

At a high level, the process is separated into a few distinct phases. First, a pre-migration analysis of the third-party database is performed by the migration analyst. A report is generated which is provided to the client and a meeting is scheduled to review the report. The report contains information about the third-party database, as well as a list of edits necessary to bring over the largest percentage of data possible. Since the schemas underlying the ARIA and third-party database systems intrinsically differ, some data cannot be migrated unless modified in the third-party database system. The edits/corrections to the third-party database must be performed by the client. Completion of these edits are very important to the project overall, as certain milestones rely on the completion of this step.

The migration analyst will perform a test migration of the various elements (patient demographic data, etc.). This is normally done via a copy of the third-party database loaded onto the ARIA test system using the T-Box. It is imperative that this T-Box is part of the Varian clinical network, without restrictions; this includes:

- Communication from T-Box to database server (ports 5000-5004 in the case of Sybase and port 1431 in the case of MS SQL Server)
- File sharing from database server to T-Box and vice versa
- IEM communications possible from T-Box to database and vice versa
- DICOM communication from T-Box to database and vice versa

After the test migration is complete, the client must thoroughly review the test data to make sure it loaded into the ARIA test system as expected. The client can access the test data directly on the test system by using the ARIA applications (Patient Explorer, RTChart, etc.). This is an iterative process – the client gives the migration analyst feedback about the test data, and the analyst does more testing. This process repeats until the client is satisfied with the test data and gives approval to proceed. The analyst is then cleared to migrate the data into the production ARIA database at the scheduled time.

The migration of the third-party database data into the production ARIA system follows a timeline that is dependent on the project and is planned on a case-by-case basis. The migration analyst and project manager work together to provide a detailed timeline.

**Single or Multiple Site Configurations**

Pricing for data transfer from third-party database to ARIA in

Due to variables between third-party and ARIA schemas, some data must first be modified in the third-party system or may not be able to be migrated. Verification of the migrated data is the client’s responsibility. Please consult your Varian representative with specific questions or concerns.
this description is for a single database configuration. This configuration can include up to six separate site locations, but they all must be operating off a single central database. If there are multiple databases or, if there are more than six site locations, the statement of work and pricing will be quoted separately by your Varian Sales person. Multiple database migrations will be performed sequentially, not in parallel. The scope of this document does not address cases where multiple database migrations are required.

Considerations

- The data from the third-party database can be transferred into an existing Varian System database however it is preferred that the third-party database data is transferred into a new (empty) Varian System database.
- The data migrated into ARIA is not the legal record of treatment. The original third-party database or charts must be archived and remain the legal record of treatment.
- All migrated data is flagged as completed and cannot be used directly for treatment delivery.
- It must be determined what system has the master copy of ADT data (third-party database or ARIA).
- If active patients are going to be switched from the third-party database to the ARIA system during the migration project, treatment plans for active patients must be re-planned and verified according to the treatment planning switchover process.
- There is a possibility of a plan name clash, which would result in what may look like a plan revision.
- Only the latest plan revision is migrated.
- Reference points between the existing data and the imported data cannot be linked. Cumulative dose across all reference points will still be accurate.

Data Transfer Elements

The following RT data elements are transferred using DICOM RT:

- Plans
- Fields
- Dose

The following data elements are transferred using the Varian IEM engine:

- Demographics
- Physician
- Next of kin
- Diagnosis
- Escribe and Escan documents

- NOTE: This will only allow the migration of 75,000 documents. If there are more documents, the statement of work and pricing will be quoted separately by the Varian product manager. Additionally, the Varian project manager should be notified that other components of the order may need to be adjusted to handle the increased initial size requirements.

- Patient clinical notes (short patient memos)

- The clinical notes will appear in ARIA as a patient document. The notes can either be combined all into one document per patient, or split out by note type. If the customer needs the clinical notes to be split out by note type, a mapping document must be completed specifying which note type goes with which document type in ARIA.

- Vitals - NOTE: The BMI field in ARIA is used for calculation of drug dosages. As such, it is not brought over as part of the conversion and must be entered manually.

- Schedule

- NOTE: The database analyst will provide a list of staff, locations, and activity codes linked to the schedule data in the third-party database. The customer must work with the Varian clinical consultant to complete a mapping document to specify which staff, location, and activity codes go with which staff, location, and activity in ARIA.

  The accuracy of the schedule migration relies on this mapping document being completed accurately!

Data Fields to be Transferred Into ARIA

- Demographics
  - Name
  - Address
  - Home phone
  - Business phone
  - Date of birth
  - Primary and secondary patient identifier
  - Social security number
  - Sex
  - Race
  - Marital status
  - Religion
  - Patient ID photo (one photo per patient)

- Physician
  - Attending physician name
  - Attending physician ID
  - Referring physician name
  - Referring physician ID
• NOTE: If IEM is implemented or if there is a preexisting library of referring physicians, the referring physician ID coming from the third-party database must match up with the ID coming through the interfaces and/or the ID that is already present in the existing library. If the IDs from the third-party database do not meet this requirement, an import of this data will cause duplicate referring physician records.

• Next of kin
  • Name
  • Address
  • Phone
  • Relationship
  • Emergency contacts are brought over as a next of kin with type Emergency

• Diagnosis
  • Admission diagnosis
    • ICD9 or ICD10 diagnosis code
    • Date of diagnosis

• RT plans
  • Only the last revision of the plan is migrated.
  • Operator name
  • Description
  • Number of fractions
  • Reference points

• RT fields
  • Only the last definition of the field is converted. If the field has multiple control points, a control point index and cumulative meter set weight must be provided for conversion.
  • Machine
  • Beam type
  • Radiation type
  • Tolerance table
  • Field type (symmetric/asymmetric/etc.)
  • Field definition (X1, X2, Y1, Y2)
  • Gantry position (angle, rotation)
  • Beam limit position (angle, rotation)
  • Patient support position (angle, rotation)
  • Table position (angle, rotation, vertical, longitudinal, latitudinal)
  • Energy
  • Dose rate
  • Accessories (wedges, applicators)
  • MLC
  • Control point index
  • Control point cumulative meter set weight

• Setup photos (two per field)
• RT treatment records
  • Field treatment data
  • Date / time of treatment
  • Treatment record note
  • Dose applied to field
  • Dose applied to reference point
  • Override parameters
  • Override authorization user name
  • Sign off user
  • Imaging sessions (PIMG placeholders representing PI or port film sessions)

• Patient clinical notes
  • Note type (as ARIA document type) (optional)
  • Subject
  • Author
  • Editor
  • Creation date
  • Edit date
  • Note text

• Scheduling information
  • Appointment date and time
  • Appointment duration
  • Resource(s)
  • Activity
  • Schedule notes

• Escribe and Escan documents
  • Patient
  • Provider who dictated document (author)
  • Document type
  • Date of service
  • Provider who approved document (if any)
  • Document (scanned documents such as .tif, jpeg, .pdf and .bmp)

• Vitals - It is possible to bring the following Vitals information into the vital signs section of ARIA.
  • Weight (lbs/kg)
  • Height (inches/cm)
  • Pulse
  • Temperature (C/F)
  • Systolic - mm Hg
  • Diastolic - mm Hg
  • Respiration
  • Pulse oximetry (O2 Sat)
• Note: The BMI field in ARIA is used for calculation of drug dosages. As such, it is not brought over as part of the conversion and must be entered manually.

Data Fields Not Transferred
• Treatment image data
• Image data – DRRs
• Billing data
• In-vivo dosimetry data
• Insurance data
• Lab - NOTE: We cannot bring over lab data directly from a third-party database. It is required that lab data be loaded from the lab information system (LIS), as the information is more complete in the LIS. This data element transfer must be coordinated by a radiation oncology interface specialist.

Limitations of the Conversion Process
• A prerequisite of all migrations is that the source database contain a consistent and unique patient ID scheme. If the migration is to an existing Eclipse™ treatment planning system/ARIA system or if IEM is implemented, the patient ID scheme of the source system must not clash or overlap with the existing patient population. Failing to reconcile patient IDs will result in duplicated and errant merges of patient records.
  o Note: it is the responsibility of the customer to reconcile all patient ID issues or other issues identified in the pre-migration analyst's report or during the testing prior to the migration of any data into the ARIA production system. Varian cannot reconcile erroneous or missing data in the third-party database.
• A copy of MS Word must be installed on the T-box in order to open documents for verification during the testing process.
• Differences in handling of prescriptions – referred to as field level scheduling
  o In the third-party database, you can make changes to a field independent from the prescription the field is assigned to. In ARIA, a change to the field results in a new prescription.
  o Example: Two fields each prescribed to receive 200 cGy. After two fractions, a change is made to the field size, resulting in two new fields. When this data is converted, all fields are converted, resulting in a prescription with four fields, each receiving 200 cGy. ARIA expects each field to be treated every fraction, so the prescription is recalculated based on four fields receiving 200 cGy for every fraction. It is important to note that the delivered dose is tracked accurately.
• Motorized wedges
  o Migration of motorized wedges is not supported.
• Relative couch fields
  o Migration of relative couch positioning data is not supported.
• The third-party database’s storage of the treatment session may result in a rounding error.
  o In the third-party database, a treatment stores the MUs delivered, but stores an approximation of the cGys delivered. In some cases, this may result in a slight rounding error upon conversion.
  o For example, the treatment history may display a value of 179.9 cGy delivered, instead of 180. Over the course of many fractions delivered, this may result in a difference of a few cGy.
• The “Dose Spec.” field in the third-party database is not converted.
  o This field is similar to ARIA’s “Prescribed %” field. In the third-party database, when the “Dose Spec.” field contains a percentage value, it typically signifies that the prescription numbers recorded in the third-party database reflect a percentage of what is actually delivered to the isocenter. When this data is converted (and when a plan from a third-party treatment planning system is received via DICOM), our “Prescribed %” field displays 100%. All numbers are converted accurately, however the intention of the prescription may not be accurately reflected. If this is a concern, the “Dose Spec.” field can be transferred as a plan note.
• Limitations of migrating non-linac- and/or non-gantry-based field and treatment data
  o Setup fields will migrate as traditional teletherapy treatment fields with a default energy and dose rate applied.
  o Brachytherapy (LDR, HDR, Injections, Implants) can only be migrated if they have been entered into the third-party database as gantry-based external beam fields. These fields will appear in ARIA as if external beam therapy was used.
  o The ability to migrate CyberKnife®, proton and cobalt therapy fields also depend on the existence of gantry-based linac data in the source system. These fields will appear in ARIA as linac, gantry-based fields.