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. Integrated data migration allows customers to have existing pertinent data from a single database migrated to a new or existing single Varian database.

This document also identifies considerations/limitations of the process and is divided in sections as follows:

- Process for data transfer
- Supported data elements and transfer techniques
- Data fields to be transferred into ARIA
- Data fields not transferred
- Important notes

**Process for data transfer**

The migration process requires a substantial time commitment (18 – 20 weeks minimum) for both the Varian migration analyst and the customer. It is highly recommended that the customer 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® technology 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 customer 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. These edits are necessary due to several structural differences between the third-party data source and the target ARIA system. The edits to the third-party...
data must be performed by the customer. Completion of these edits is very important to the project overall, as certain milestones rely on the completion of this step.

Next the migration analyst performs a test migration of the various elements (patient demographic data, RT data etc.). Testing work is completed using a copy of the third-party database loaded onto the ARIA test system (T-Box). After the test migration is complete, the customer must thoroughly review the test data within the ARIA applications to make sure it loaded into the ARIA test system as expected. This is an iterative process — the customer gives the migration analyst feedback regarding the test migration, and the analyst may repeat portions of the test migration to resolve issues. This process repeats until the customer is satisfied with the test migration and gives approval to proceed.

Finally, the migration of third-party data into the ARIA system will happen according to a project-specific timeline. The migration analyst and Varian software project manager work together to create a detailed timeline and track progress during regular project calls. Due to timing limitations, historic RT data will not be transferred until after the ARIA system is live.

Supported data elements and transfer techniques

The following RT data elements are transferred using DICOM RT:
- Plans
- Fields
- Treatment records

The following data elements are transferred using HL7:
- Demographics
- Physician
- Schedule
- Referring physician master file
- Next of kin
- Diagnosis

Patient documents and clinical notes are transferred using Varian’s web service platform and will be visible within the ARIA documents workspace.

- NOTE regarding documents: The database analyst will provide a list of document types stored in the third-party system – the customer (normally working with a Varian clinical consultant) must use this list to create a mapping document to specify which document types in the third-party database map to equivalent document types in ARIA.

- NOTE regarding clinical notes: Clinical notes are combined (sorted by date and note type) and stored in ARIA as a document.

- NOTE regarding referring physician transfer: If IEM/ARIA Connect interfaces are implemented or if there is a pre-existing library of referring physicians, the referring physician ID coming from the third-party database must match 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 lead to incomplete or duplicate referring physician records.

- NOTE regarding schedule: 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 assigned 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, source files must be: JPEG, TIFF, BMP or PNG)

- Physician
- Attending physician name
- Attending physician ID
- Referring physician name
- Referring physician ID
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, source files must be: JPEG, TIFF, BMP or PNG)

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 (Patient imaging placeholders representing portal image or port film sessions)

Patient clinical notes
- Note type (as ARIA document type) (optional)
- Subject
- Author
- Editor
- Creation 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 (.doc, .rtf, .tif, jpeg, .pdf and .bmp)
Data fields not transferred

- Treatment image data
- Image data – DRRs
- Billing data
- In-vivo dosimetry data
- Insurance data
- Current medication list
- Clinical assessments
- Motorized wedges
  - Migration of motorized wedges is not supported.
- Relative couch fields
  - Migration of relative couch positioning data is not supported.
- Vital signs data

**NOTE** regarding lab data: 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.

Important notes

**Environment**

- The T-Box needs to be configured as part of the Varian clinical network and support:
  - Communication from T-Box to database server on port 1431 for Microsoft SQL server
  - File sharing from database server to T-Box and vice versa
  - HL7 communications possible from T-Box to database server
  - Communication from T-Box to the ARIA web server on port 56001
  - DICOM communication from T-Box to database and vice versa
- A copy of Microsoft Word and Adobe Reader must be installed on the T-box in order to open documents and reports for verification during the testing process.

**Decisions and Actions**

- The data migrated into ARIA is not the legal record of treatment. The original third-party database or charts must be archived and will remain the legal record of treatment.
- It must be determined what system has the master copy of ADT data (third-party database or ARIA). That is, it needs to be established whether or not the third-party system will overwrite any existing base demographic records in ARIA.
- A prerequisite of all migrations is that the source database contains a consistent and unique patient ID scheme. If the migration is to an existing Eclipse™ treatment planning system/ARIA system or if IEM/ARIA Connect interfaces are 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 or errant merges of patient records.
- It is the responsibility of the customer to reconcile all issues identified in the pre-migration report as well as any issues raised during the testing phase. Varian cannot reconcile erroneous or missing data in the third-party database and Varian cannot move forward with the production migration until all issues have been cleared.
- Treatment plans for active patients must be manually replanned and verified according to the treatment planning switchover process during the cutover to ARIA.

**Data**

- Only the latest plan revision is migrated.
- All migrated data is flagged as completed and cannot be used directly for treatment delivery.
- There is a possibility of a plan name clash, which would result in what may look like a plan revision.
- Reference points between the existing data and the imported data cannot be linked. Cumulative dose across all reference points will still be accurate.
- Differences in handling of prescriptions, referred to as field-level scheduling
  - In the third-party database, you can make changes to a field independently from the prescription the field is assigned to. In ARIA, a change to the field results in a new prescription.
  - Example: Two fields are 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.
- The third-party database’s storage of the treatment session may result in a rounding error.
  - 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.
- 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.

- Limitations of migrating non-linac- and/or non-gantry-based field and treatment data
  - 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.
  - The ability to migrate CyberKnife®, proton and cobalt therapy fields also depends on the existence of gantry-based linac data in the source system. These fields will appear in ARIA as linac, gantry-based fields.

- The “Dose Spec.” field in the third-party database is not converted.
  - 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.

* Single or multiple site configurations: This technical perspectives for data migration is for data transfer from a third-party database to ARIA in a single database configuration. A single database configuration can include up to six separate site locations, but they all must be operating off a single central database. 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.

** This general summary is only a general guide, and the information discussed here is subject to change without notice. Please consult the Instructions for Use, user manuals and MyVarian for additional product information.

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**Intended Use Summary**

The ARIA oncology information system is designed to assist the oncology staff in managing the patients’ entire course of treatment, approving treatment plans, and performing quality assurance review of the treatment, i.e., to follow-up on the delivered treatments and dose to the defined site. The indications for use include any disease or condition treatable with radiation therapy, including but not limited to cancer.

**Safety Statement**

Side effects are related to the treatments delivered independent of our software and must be discussed by the clinician with the patient on a case-by-case basis. Medical providers shall retain the authority to direct all medical decisions regarding the care and treatment of its patients. Varian Medical Systems is not authorized or qualified to engage in activities that may be construed or deemed to constitute the practice of medicine.

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