

From ODM to SDTM: An end-to-end approach applied to phase I clinical trials



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INTRODUCTION

The primary goal in phase I clinical studies is to assess the characteristics of the compound in man, including safety and bioavailability. The studies typically include healthy subjects for short treatment periods. Duration of enrolment period, study conduct and data cleaning is shorter than in phase II and phase III. However, data management requirements are similar and activities must be efficiently organized to keep these shorter timelines.

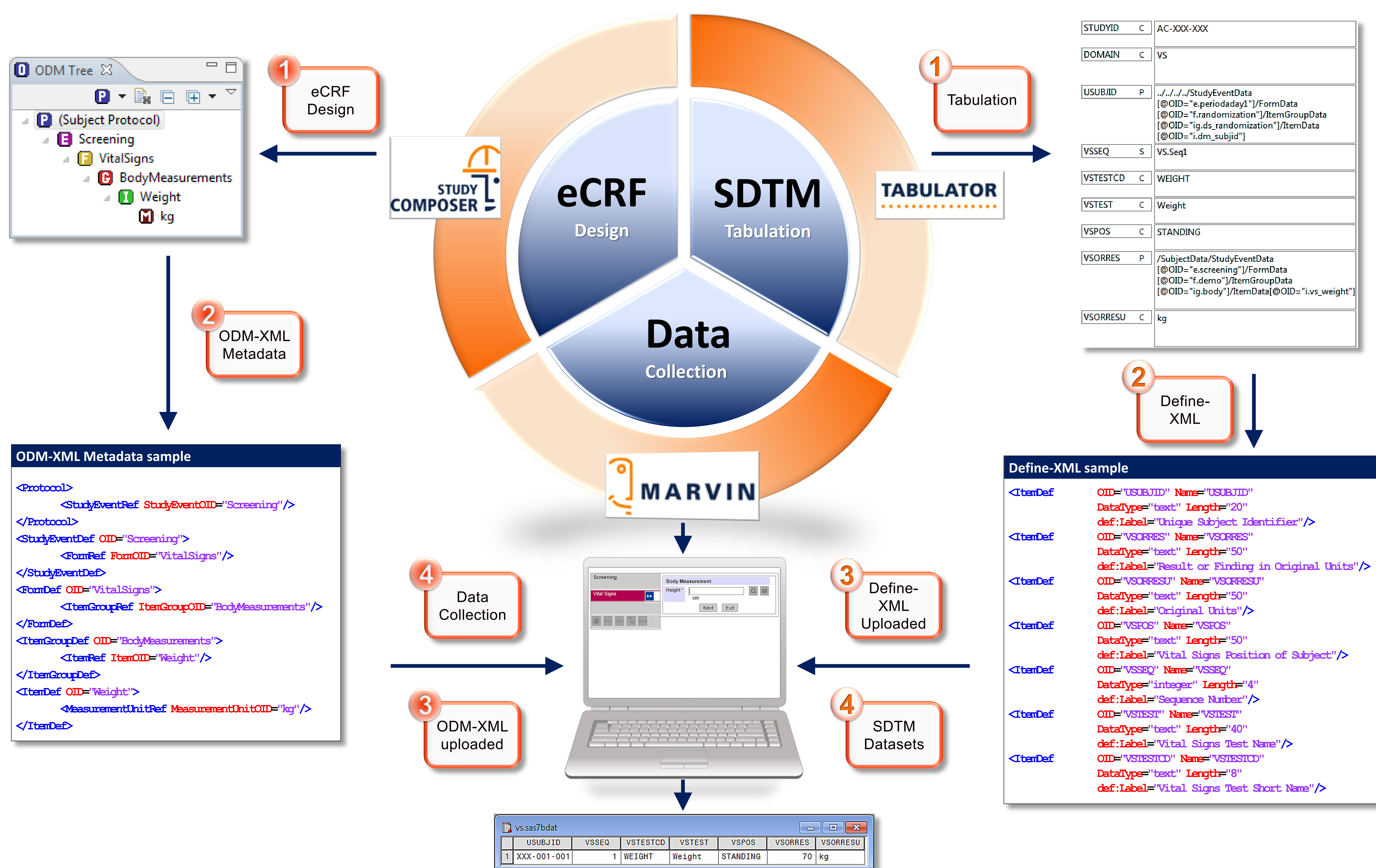
To tackle this challenge, Actelion Clinical Pharmacology developed a Clinical Data Management (CDM) model in which the data manager conducts all activities from electronic Case Report Form (eCRF) design to data collection and cleaning until delivery of Standard Data Tabulation Model (SDTM) datasets to the statisticians. To avoid switching from an eCRF designer software to an Electronic Data Capture (EDC) system to SAS® for the data tabulation, we have chosen the integrated Xclinical software solution that covers all these activities.

SDTM MAPPING

The data manager maps the clinical data to SDTM format using the ODM-XML he/she has generated during the design of the eCRF.

ODM defines data points using a hierarchical structure, defining data points by items, item groups, forms, events, and subjects whereas SDTM^[2] defines clinical data in standard domains, variables, and records that are independent of the eCRF structure. These structural differences require a large programming effort in order to map the clinical data to the SDTM format.

The TABULATOR® module smoothens this step by defining the tabulations as paths from the ODM-XML metadata to the SDTM variables or as a calculation between several ODM-XML data points^①. Defining these tabulations generates automatically the Define.xml^[3] describing the structure of the SDTM datasets^②. Once uploaded into MARVIN®^③, the tabulations convert the current ODM-XML data into SDTM datasets^④.



ODM DEFINITION

The data manager designs the eCRF keeping in mind the future SDTM mapping and he/she ensures that the collected data will fulfill the SDTM requirements.

This step is performed using the **STUDY COMPOSER®** module^① of the Xclinical software package. The structure of the eCRF is based on the Operational Data Model^[1] and the module allows defining data points in term of Event, Form, Item group and item. ODM-XML metadata generation is automatic and runs in the background^②.

The ODM-XML is uploaded into the web-based **MARVIN®** EDC module that generates the Data Entry Screens^③. From the EDC, the clinical site personnel enters the clinical data that are recorded into the clinical database^④.

CONCLUSION

In this CDM model, the data manager has the complete oversight and control of the clinical data from collection to delivery for statistical analysis. It offers a unique opportunity to consistently align all data management activities and outputs in an end-to-end approach.

The Xclinical software solution was found to be ideal since it supports the data managers in all their activities within a single environment.

Following this process, Clinical Pharmacology Data Management at Actelion delivers the eCRF within four weeks after the clinical protocol is released and the first set of SDTM datasets two weeks after first data entry. Thus, CDM activities have a limited impact on the study timelines and especially on the statistical analysis.

REFERENCES

- [1] CDISC Operational Data Model, <http://www.cdisc.org/odm>
- [2] CDISC Standard Data Tabulation Model, <http://www.cdisc.org/sdtm>
- [3] CDISC Define-XML, <http://www.cdisc.org/define-xml>