

CDISC for the Medical Device and Diagnostic Industry: An Update

Carey Smoak, Roche Molecular Systems, Inc., Pleasanton, CA

ABSTRACT

In May, 2006 a CDISC SDTM Device sub-team was formed. Since the inception, the team has expanded in terms of scope and representation (FDA, SDS, CDASH and industry). The scope has expanded from creating new domains for device data to also reviewing the sixteen CDASH domains. Possible domains include device properties, accountability and malfunctions. The Device sub-team has expanded its representation and now has more than fifty members. Recruitment of new industry experts was primarily accomplished through an organization called AdvaMed. The Device sub-team is working towards to the goal of having new domains and the sixteen CDASH domains incorporated into CDASH version 1.1 in 2010.

INTRODUCTION

Currently, SDTM is not configured to allow medical device and diagnostic companies to be able to submit data to the FDA in CDISC. Therefore, there is a need to modifying existing SDTM domains and to develop new domains to allow medical device and diagnostic companies to be able to submit data to the FDA in CDISC. In May, 2006 an SDTM Device sub-team was formed to begin work on reviewing SDTM domains and developing new domains (Smoak 2007).

Initially, the FDA representatives on the Device sub-team were from CDRH (www.fda.gov/cdrh). In the past year, representative from CBER (Center for Biologics Evaluation and Research – www.fda.gov/cber) have been added. CBER is involved devices that pertain to blood screening and HIV testing.

In February, 2009, at the CDISC INTRACHange meeting, the Device sub-team met with representatives from a medical device organization called AdvaMed (www.advamed.org), CDASH team members and representatives from CBER and CDRH at the FDA.

The Device sub-team now has more than 50 members – composed of various industry experts (including diagnostic, implantable and imaging devices), representatives from CDRH and CBER at the FDA, SDS team members and CDASH team members. Recruitment of new industry experts was accomplished with the assistance of an organization called Advamed (www.advamed.org).

In this paper, I will use the term devices to refer to both medical devices and diagnostic products.

THE IMPORTANCE OF DEVICES

Devices in and of themselves are important. For example, devices like heart stents may save peoples' lives and blood screening instruments that test blood for the presence of HIV helps to keep the blood supply safe.

At the FDA last year (January, 2008 through November, 2008), 697 Premarket Approvals (PMAs) were approved by Center for Devices and Radiologic Health (CDRH) (<http://www.fda.gov/cdrh/pmapage.html> January 21, 2009). In contrast, during the same time frame, 67 New Drug Applications were approved by Center for Drug Evaluation and Research (CDER) (<http://www.fda.gov/cder/rdmt/InternetNDA08.pdf> January 21, 2009). This is not intended to imply that devices are more important than therapeutic products. Rather the point is simply that devices are important. For more information about the PMA process for devices please see the article by Campbell (2006).

Not only are devices important in and of themselves, but devices are also important when used in conjunction with therapeutic products. For example, contrast agents in imaging devices may be used to monitor therapeutic agents. Drug eluting heart stents may be used to treat cardiovascular disease. Diagnostic assays may be used to determine if a therapeutic product will work in a patient. This last area may include targeted therapies and companion diagnostics in which a diagnostic test may be used to identify when a targeted therapy may work in a particular patient.

UPDATE

CRF-ANALYSIS

More than 170 Case Report Forms (CRFs) were collected from more than 40 device companies. A frequency analysis of these CRFs is being performed on the sixteen CDASH domains. The purpose of the frequency analysis is to find out where devices differ from the current CDASH domains and to modify the CRFs for devices where necessary. The goal is to incorporate these modifications for devices into CDASH version 1.1 in 2010.

DEVICE PROPERTIES DOMAIN

The purpose of the Device Properties (DP) domain is to describe properties and characteristics about the devices (Smoak 2008a). The DP domain will be a Findings Observation Class domain and can be thought of as findings about a device. The CDASH (data collection) and SDTM (data submitted to the FDA) versions of the DP domain are being worked on at the same time. This is the very first time that CDASH and SDTM versions of the same domain have been developed at the same time.

DEVICE MALFUNCTIONS DOMAIN

Device malfunctions are problems that occur with a device. For instance, a software error or an instrument error could be a device malfunction. The work on device malfunction by the Device sub-team has just begun. To date we have collected lists of device malfunctions from various companies. It is likely that the Device Malfunction domain will be an Event Observation Class domain.

It is likely that information from a device malfunction could be captured in an Event observation class type of domain. Events are defined as "occurrences or incidents independent of planned study evaluations during the trial (e.g., adverse events) or prior to the trial (e.g., medical history)" (Wood and Guinter 2007).

Device malfunctions may be of particular interest to the FDA since a malfunction may lead to an adverse event in a subject. The FDA Amendments Act of 2007 was signed into law on September 27, 2007. This act includes the establishment of a Unique Device Identification system and when implemented will require:

- The label of a device to bear a unique identifier
- The unique identifier to identify the device through distribution and use
- The unique identifier to include a lot or serial number, if required by the FDA

The unique device identifier is a work in progress by the FDA. For more information about this unique device identifier, please go to www.fda.gov/cdrh/ocd/udi (Smoak 2008b).

DEVICE ACCOUNTABILITY DOMAIN

Work has also begun on developing a device accountability domain. The purpose of this domain would be to track the use of devices in a clinical trial. The domain would be similar in concept to drug accountability.

NEXT STEPS

Much work remains to be done by the Device sub-team. Once the new domains (properties, malfunctions and accountability) have been developed and the sixteen CDASH domains have been reviewed then they will go through an intensive review process before being incorporated into CDASH version 1.1 and into SDTM. Initially, this package (the new domains and the review of the sixteen CDASH domains) will be reviewed by the CDISC Technical Leadership Committee. Once this committee approves the package, the review by other industry experts and eventually public review on the CDISC website will be a part of the intensive review process before becoming a part of CDASH version 1.1 and SDTM.

SAS® AND CDISC

SAS has developed a new Clinical Standards Toolkit which will validate the CDISC SDTM standard (both WebSDM and Janus rules) and produce the CRT-DDS (define.xml) documentation files (<http://www.sas.com/news/preleases/062308/SASforClinicalDI.html> July 14, 2009). The Clinical Standards Toolkit is a set of macros which can be updated as standards change. This last point is of benefit to devices. When a new SDTM standard becomes available for devices then the Clinical Standards Toolkit should work for devices. In other words, the SAS macros (Clinical Standards Toolkit) should be able to validate SDTM for devices and produce an appropriate CRT-DDS (define.xml) document.

The Clinical Standards Toolkit should be available in July, 2009 and will be a part of BASE/SAS.

CONCLUSION

In May, 2006 a CDISC SDTM Device sub-team was formed. The team has expanded in terms of scope and representation. The team is working towards the goal of developing new device domains and reviewing the sixteen CDASH domains so that medical device and diagnostic companies will be able to submit data to the FDA in CDISC.

REFERENCES

Campbell G. "The Role of Statistics in Medical Devices – The Contrast with Pharmaceuticals." *Biopharmaceutical Report* 14:1-8, 2006.

Smoak C. "CDISC for the Medical Device and Diagnostic Industry." *Proceedings of the Pharmaceutical Industry SAS® Users Group*. June 2007. <<http://www.lexjansen.com/pharmasug/2007/fc/fc10.pdf>>

Smoak C. "Mission Possible: A Proposed SDTM Domain for the Medical Device and Diagnostic Industry."

Proceedings of the Pharmaceutical Industry SAS® Users Group. June 2008a.
<<http://www.lexjansen.com/pharmasug/2008/rs/rs03.pdf>>

Smoak CG. "A CDISC SDTM model for the medical device and diagnostic industry." *Pharmaceutical Programming* 1:28-30,2008b.

Wood F, Guinter T. "Evolution and Implementation of the CDISC Study Data Tabulation Model (SDTM)." *Proceedings of the Pharmaceutical Industry SAS® Users Group*. June 2007.
<<http://www.lexjansen.com/pharmasug/2007/fc/fc08.pdf>>

Wood F. "The CDISC Study Tabulation Model (SDTM): History, Perspective, and Basics." *Proceedings of the Pharmaceutical Industry SAS® Users Group*. June 2008. <<http://www.lexjansen.com/pharmasug/2007/rs/rs10.pdf>>

ACKNOWLEDGMENTS

I want to thank the members of the CDISC SDTM Device sub-team for their hard work and input. I also want to thank AdvaMed for helping with recruiting new industry experts for the team.

CONTACT INFORMATION

Your comments and questions are valued and encouraged. Contact the author at:

Carey G. Smoak
Manager, SAS Programming
Roche Molecular Systems, Inc.
4300 Hacienda Drive
Pleasanton, CA 94588
Tel. 925-730-8033
Fax 925-225-0195
carey.smoak@roche.com

SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc. in the USA and other countries. ® indicates USA registration.

Other brand and product names are trademarks of their respective companies.