IMPROVE EFFICIENCY AND PRODUCTIVITY OF STATISTICAL OUTPUT

Nancy Wang, PhD
Celerion (formerly MDS Pharma Services) Lincoln, Nebraska, USA

INTRODUCTION

Statistical output is often a product of individual practice and reflects individual preference. However, as an early phase contract research organization (CRO) in the pharmaceutical industry serving many clients with one ultimate goal (product to market), delivering of statistical output with efficiency and productivity is the key to business success. Standardization leads the path to improved efficiency and productivity.

WHY STANDARDIZE

When operations are standardized, output quality is consistent, timelines are estimable, output is easy to QC and review, staff training and expectation are uniform, and the processes are readily reproducible.

WHERE TO STANDARDIZE

Template for Statistical Analysis Plan

- Standard contents to consistently include important aspects of the study and data analysis such as:
  - study design and endpoints
  - treatment description
  - analysis populations
  - handling of early withdrawal, missing data, rechecks, and BLQ values, calculations of baseline and analysis variables
  - specify dictionary used for coding
  - interim analysis requirements
  - statistical assumptions and methods
  - use of decimal points and significant digits
- Standard verbiage and formula to provide clear and consistent description of information and methods, provide SAS codes if applicable
- Include details for programmer to make SAP a programming guide
- Follow ICH report structure to make incorporation of statistical results seamless
- Get end-user approval before execution
- Standard Templates for Other Documents
  - Edit Check Plan
  - Data Management Plan
  - Reports (statistical, top-line, ICH, eCTD)
  - Other technical documents

SAS Codes

- Same codes for the same algorithm and calculation to derive variables
- Same procedure codes for the same statistical analyses given study design, such as ANOVA and regression.
- Same statistical method for the same testing, such as normality, homogeneous variance, outlier testing, bioequivalence, dose proportionality, steady state, etc. whenever possible

Input

- Consistent database design to provide consistent input data structure, naming convention, and data format
- Use of CDISC compliant data structure and nomenclature
  - CDASH for data collection
  - SDTM for data listings
  - ADaM for analyses, tables and figures

Output

Same layout for same data type in listings, tables, and figures to utilize standard macros
- Pharmacokinetic concentration and parameter tables
- Subject disposition listing and table
- Adverse event listing and tables
- Shift tables for results with normal ranges
- Statistical comparison tables for bioequivalence, non-inferiority, Helmerts Contrasts, etc.
- Figures for observations over time
- Correlation figures

BENEFITS FROM STANDARDIZATION

- Staff training – clear objectives, methods and expectations
- QC and Review – easy to spot inconsistencies and deviations
- Operation procedures – work flow is stable and easy to monitor for improvement
- Documentation – establish consistent and complete SOPs and Procedure Guides
- Submission ready – CDICS datasets and ICH eCTD reports
- Systematic approaches are manageable and reproducible
- More time and attention for study specific issues

CONCLUSION

The more standardization is applied to the delivery of the common information clinical trials share, the more attention can be given to study specific details to ensure study objectives are appropriately addressed with quality and on time. When efficiency is achieved, productivity follows naturally and scientists can stay focused on science.