



Introduction of ArtZ-Standard TLF Macros and Output Validation

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Background

- Industry requirement
 - The FDA certification is faster, the more benefits we will help for clients to get. The statistical analysis as an important point to submit the results to FDA need more efficient along with the development of drug clinical trial.
- Technical feasibility
 - The most of the statistical analysis tables has similar pattern and common characters, which provide the foundation of the development of standard TLF macros

Common Characters

- Basic Counting Tables
 - Disposition
 - Adverse Events
 - Prior / Concomitant Medications
 - Medical History

Common Characters

- Basic Classes of Counting

- One Row

TOTAL NUMBER OF TREATMENT- EMERGENT ADVERSE EVENTS	xxx	xxx	xxx
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- Categorical

PRIMARY REASON FOR DISCONTINUATION			
REASON #1			
REASON #2	xx (xx.x)	xx (xx.x)	xx (xx.x)
REASON #3	xx (xx.x)	xx (xx.x)	xx (xx.x)
REASON #4	xx (xx.x)	xx (xx.x)	xx (xx.x)
REASON #5	xx (xx.x)	xx (xx.x)	xx (xx.x)

- Nested

SYSTEM ORGAN CLASS #1	xx (xx.x)	xx (xx.x)	xx (xx.x)
PREFERRED TERM #1	xx (xx.x)	xx (xx.x)	xx (xx.x)
PREFERRED TERM #2	xx (xx.x)	xx (xx.x)	xx (xx.x)

- Shifted

Timepoint	Low	Normal	High
MIN POST-BASE VALUE			
Low	0	0	0
Normal	0	10	1
High	0	0	54

Common Characters

Summary statistics tables

- standard horizontal display

Visit	Actual Value					
Treatment Group	n	Mean	SD	Median	Min	Max
BASELINE						
~TREATMENT 1~ (N=xxx)	xxx	xx.x	xx.xx	xx.x	xx	xx
~TREATMENT 2~ (N=xxx)	xxx	xx.x	xx.xx	xx.x	xx	xx
~TREATMENT 3~ (N=xxx)	xxx	xx.x	xx.xx	xx.x	xx	xx
Total (N=xxx)	xxx	xx.x	xx.xx	xx.x	xx	xx

- standard vertical display

Visit	~Treatment 1~ (N=xx)		~Treatment 2~ (N=xx)	
	Actual Value	Change From Baseline [1]	Actual Value	Change From Baseline [1]
BASELINE				
n	xx		xx	
MEAN (SD)	xx.x [xx.xx]		xx.x [xx.xx]	
MEDIAN	xx.x		xx.x	
MIN, MAX	xx, xx		xx, xx	

Common procedure

- Analysis
 - Proc Freq/Proc Sql/Proc Mean/Proc Summary
- Reconstruct the data following the shell
 - Proc Transpose
- Report
 - Proc Report

Standard TLF Macros in PPD - ArtZ

- ArtZ, stands for “**r**eporting **t**ools from **A** to **Z**.”, are designed to make the analysis of all domains and all kinds of shell reporting of clinical data quick, consistent and accurate.

Some modules in ArtZ

- Analysis Macros
BIGN, COUNT_ONE_ROW, COUNT_CATEGORICAL,
COUNT_SHIFT, COUNT_NESTED, SUMM_STATS, etc.
- Utility Macros
ALIGN, TRANSPOSE, etc.
- Reporting Macros
PAGEBREAK, REPORT_BASIC, RTF_PARSE, etc.

Programming as building blocks

- Based on standard layouts of common tables, the integrated suite of small, distinct macros can be used as building blocks to develop many of the common tables in a Statistical Analysis Plan (SAP).



An AE example

Table 14.3.X.X
Summary of Treatment-Emergent Adverse Events [by Subgroup]
Analysis Set

[Subgroup: XXXXXXXX]

	Treatment 1~ (N=xxx)	Treatment 2~ (N=xxx)	Treatment 3~ (N=xxx)	Total (N=xxx)
System Organ Class	n (%)	n (%)	n (%)	n (%)
Preferred Term	n (%)	n (%)	n (%)	n (%)
TOTAL NUMBER OF TREATMENT- EMERGENT ADVERSE EVENTS	xxx	xxx	xxx	xxx
NUMBER OF ~SUBJECTPATIENT~S WITH AT LEAST ONE TREATMENT- EMERGENT ADVERSE EVENT	xx (xx.x)	xx (xx.x)	xx (xx.x)	xx (xx.x)
SYSTEM ORGAN CLASS #1	xx (xx.x)	xx (xx.x)	xx (xx.x)	xx (xx.x)
PREFERRED TERM #1	xx (xx.x)	xx (xx.x)	xx (xx.x)	xx (xx.x)
PREFERRED TERM #2	xx (xx.x)	xx (xx.x)	xx (xx.x)	xx (xx.x)
...				

Note: The total number of AEs counts all treatment-emergent AEs for ~subjectpatient~s within the subgroup specified. In System Organ Class and Preferred Term summarization, a ~subjectpatient~ is counted once if the ~subjectpatient~ reported one or more events.
Adverse Events were coded using MedDRA, Version XXX.X.

Source Data: Listing X,Y

<DIRECTORY PATH>PROGRAM NAME Executed: XXXXXXXX.XXX

Prog Note: AEs will be sorted in descending order of frequency of SOC based on the total of all treatment groups. Within each SOC, AEs will be sorted in alphabetical order of preferred term.

c773_t_ae.sas

The Advantage of ArtZ

- The modular structure and the series of macros allows us to batch produce most of the tables/listings.
 - The basic counting tables
 - The basic summary tables
- PPD ArtZ team have developed lots of templates program like building blocks following the standard TLs shell, then we can include the programs directly, just need to adjust some parameters according to the actual shell.

Automated Validation Utility- RTFPARSE/AVUPARSE

- Three methods of validation
- Validation by manual comparison between programmer's output and validator's independently programmed output.
- Proc compare between programmer's data set before report and validator's independently programmed final data set.
- RTFPARSE method
- Proc compare between data set containing parsed programmer's ASCII/RTF file and validator's independently programmed final data set.

The Parsing Module

- Example of listing file and associated comparison data set:

Listing file:

Treatment Group: Drug

CRTN/ Pat. No.	Visit	Time	Drug Class	Dose	Unit	Frequency	Start Date	Any Change?	End Date	Start Day[1]	Start Day[2]	Ongoing?
29343/1033	1	1200	ABC123	600	MG	QD	03JAN2001			-58		ONGOING
		1300	XYZ456	300	MG	BID	03JAN2001			-58		ONGOING

Comparison data set:

Report of validator's data from COMPSET (validate)

obsnum compvar

```
1 Drug»29343/1033»1»1200»ABC123»600»MG»QD»03JAN2001» » »-58» »ONGOING
2 Drug»29343/1033»1»1300»XYZ456»300»MG»BID»03JAN2001» » »-58» »ONGOING
```

The Advantage of RTFPARSE Macro

- Compare with the first method
 - It can parse all the characters of the output, don't need manual comparison, which makes the validation more automated and quality.
- Compare with the second method
 - Data before report always contains '^n' or '^w' to control the space and wrap.
 - There maybe some difference between the data set before report and the actually reported data
e.g. ods escapechar='^';

Clinical study statistical analysis

- More Automated and modularized programming
- More Efficient and more quality

**THANK
YOU EVERYONE**