

REPRESENTATION OF QUESTIONNAIRES, RATINGS, AND SCALES (QRS) ITEMS IN SDTM: LOGICALLY SKIPPED ITEMS & CONDITIONAL BRANCHING

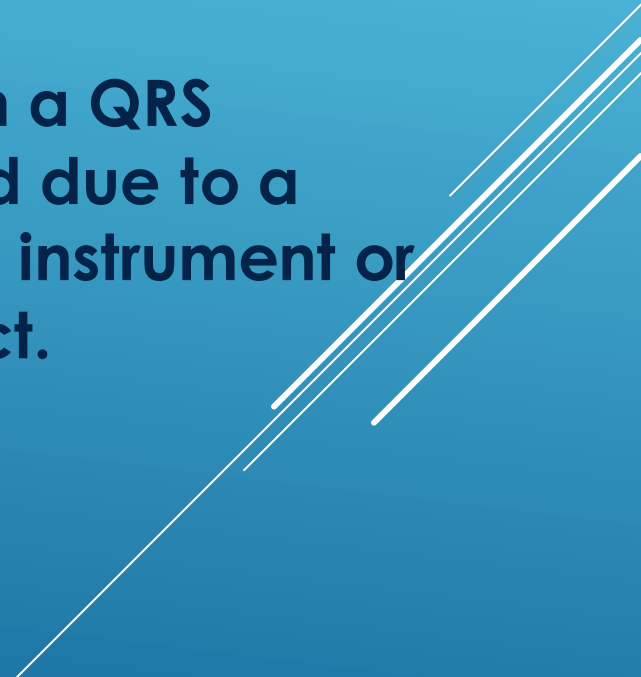
02.23.2023

SOME HISTORY...



THE DEFINITION FOR LOGICALLY SKIPPED ITEMS WAS...

Logically skipped items (e.g., questions) on a QRS instrument are items which may be skipped due to a specific response to a previous item on the instrument or when the item does not apply to the subject.

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FDA STUDY DATA TECHNICAL CONFORMANCE GUIDE

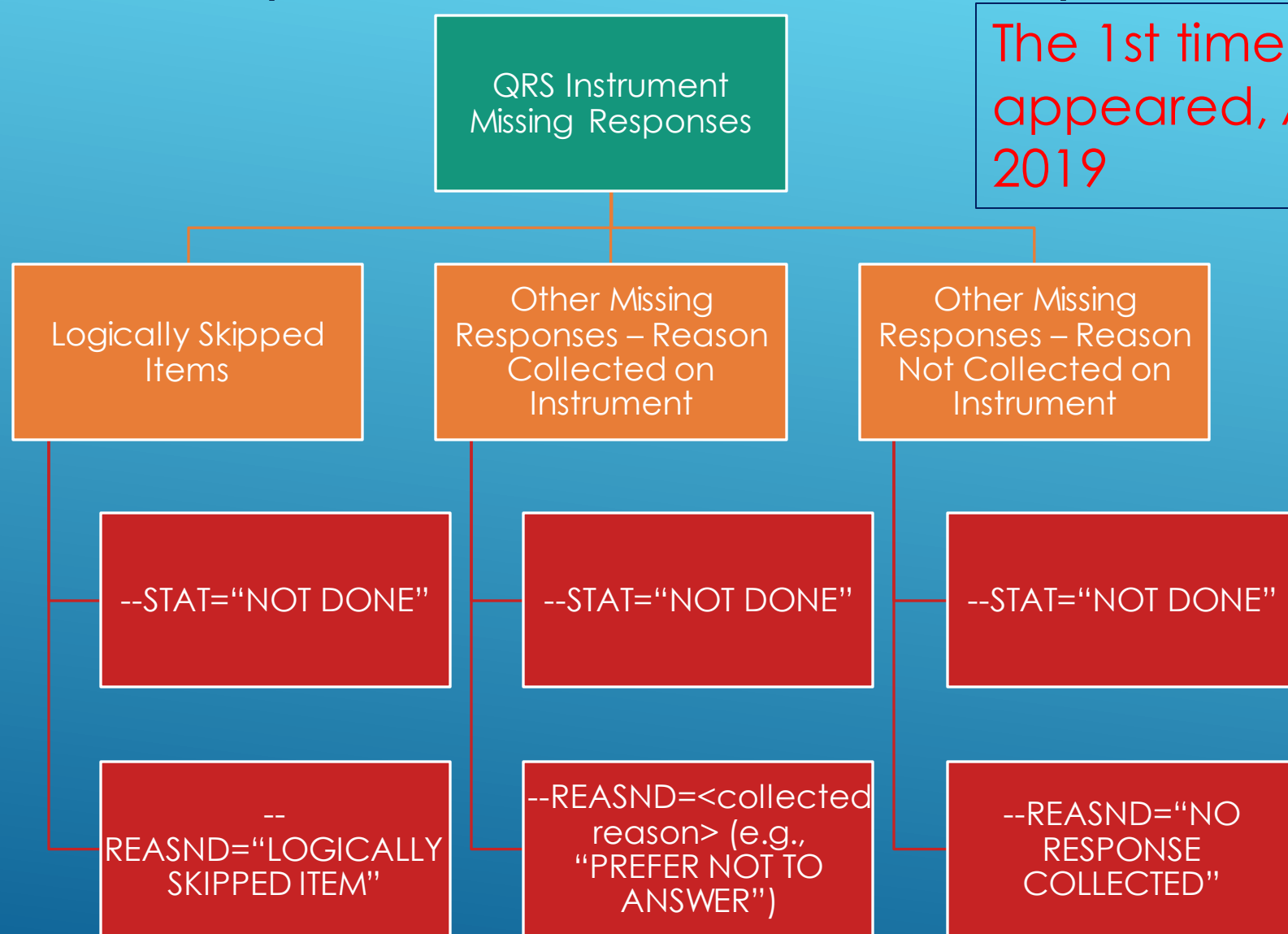
If instructions on how to record and/or score responses to logically skipped items are available from the instrument developer, then records for logically skipped items should be included in the submission dataset with the following:

- QSSTAT = “NOT DONE”;
- QSREASND = “LOGICALLY SKIPPED ITEM”; and
- QSORRES, QSSTRESC, and QSSTRESN would be assigned according to the instrument’s instructions.

If instructions on how to record and/or score responses to logically skipped items are not available from the instrument developer, then records for logically skipped items should be included in the submission dataset with the following:

- QSSTAT = “NOT DONE”;
- QSREASND = “LOGICALLY SKIPPED ITEM”; and
- QSORRES, QSSTRESC, and QSSTRESN all set to null.

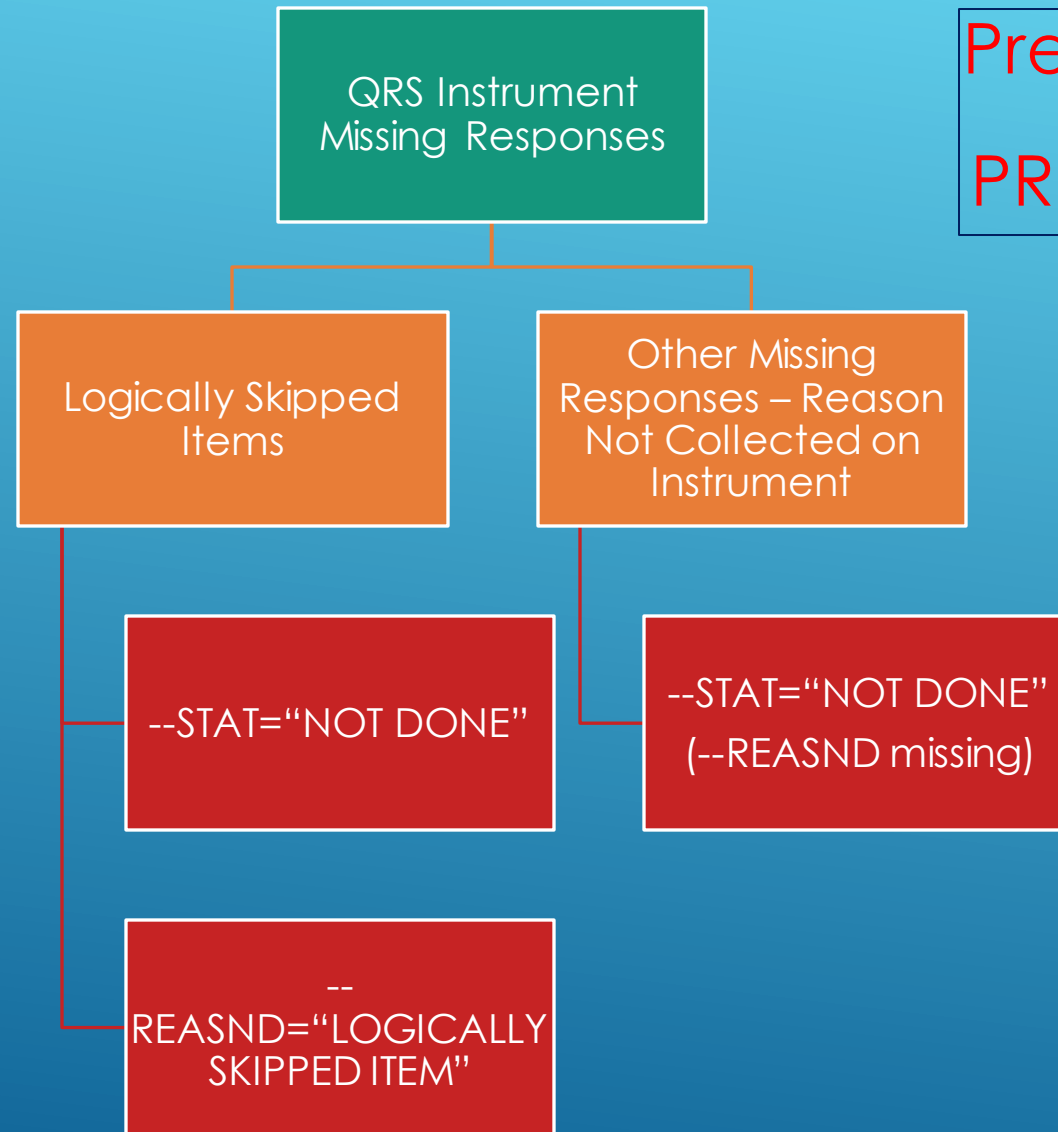
TREE DIAGRAM FOR DETERMINING --REASND (FROM AUGUST 27, 2019)



The 1st time this chart appeared, Aug 27, 2019

*Note: --ORRES, --STRESC, --STRESN are missing in all of these instances.

TREE DIAGRAM FOR DETERMINING --REASND (PRESENTED JANUARY 21, 2020)



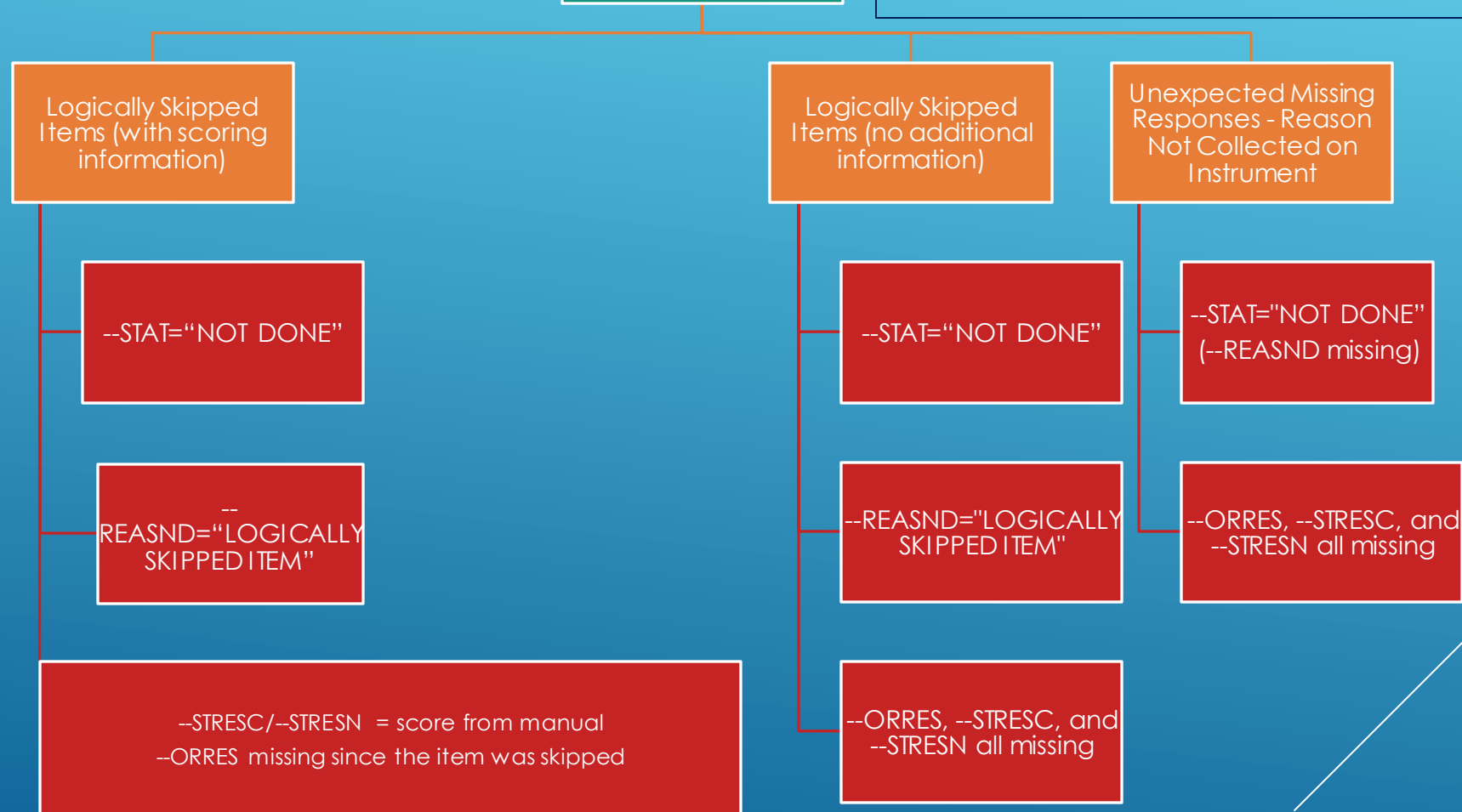
Presented Jan 21, 2020,
this is another
PREVIOUSLY proposed.

*Note: --ORRES, --STRESC, --STRESN are missing in all of these instances.

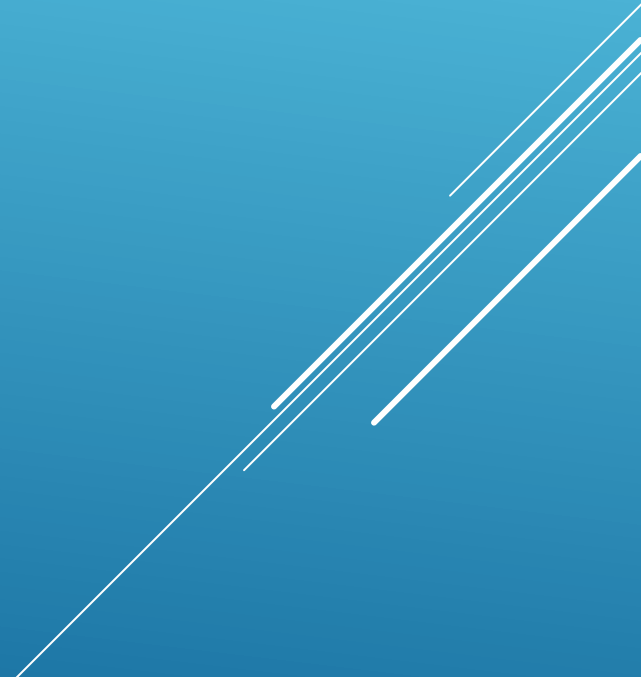
TREE DIAGRAM FOR DETERMINING --REASND

QRS Instrument Missing
Responses (Expected
and Not Expected)

Presented Mar 8, 2021, this is
another PREVIOUS proposal.



WITH 2022 COMES CONDITIONAL
BRANCHING...



CONDITIONAL BRANCHING AND THE PRO-CTCAE

- PRO-CTCAE logic branches from frequency to severity to interference. PRO-CTCAE uses conditional branching to determine if items need to be presented to a subject.
- For example, if a PRO-CTCAE item never occurs (frequency item response is QSORRES = Never), then the severity and interference items are never presented to the subject, but they are provided a score of 0.
- According to the PRO-CTCAE expert CDISC has spoken with, NIH does not consider these items to be skipped because a score is assigned to the item or items that were not presented to the subject.

CONDITIONAL BRANCHING

- According to PC Mag, conditional branching is “A programming instruction that directs the computer to another part of the program based on the results of a compare.”
- In questionnaires, ratings, and scales (QRS) this might be written: Conditional branching on a QRS instrument is when the instrument, or the electronic data entry of the instrument, directs the subject to another part of the instrument based on a given condition.

CONDITIONAL BRANCHING AND LOGICALLY SKIPPED ITEMS

- Conditional branching is very similar to what we have been calling “logically skipped items”.
- The only difference between PRO-CTCAE items that have not been presented to a subject and logically skipped items is that CDISC hasn’t had a use case in which the items were skipped and a score assigned to the items.
- So, while PRO-CTCAE items are not “skipped”, they are not presented to the subject *based on a given condition*, i.e., due to a specific response to a previous item on the instrument, which is a significant part of the definition of logically skipped item.

CONDITIONAL BRANCHING AND LOGICALLY SKIPPED ITEMS

- The other part of the definition for logically skipped items is, "...or when the item does not apply to the subject." such as when an item is used if something happened (e.g., weight decreased) or a different item is used if something else happened (e.g., weight increased). These items that do not apply are ones that the instrument directs the subject to answer or not *based on a given condition* (e.g., weight).
- Looking at the earlier definition of conditional branching as applied to questionnaires, ratings, and scales: Conditional branching on a QRS instrument is when the instrument directs the subject to another part of the instrument *based on a given condition*.

CONDITIONAL BRANCHING AND LOGICALLY SKIPPED ITEMS



- Conditional branching and logically skipped items have the same logic and are essentially the same thing!

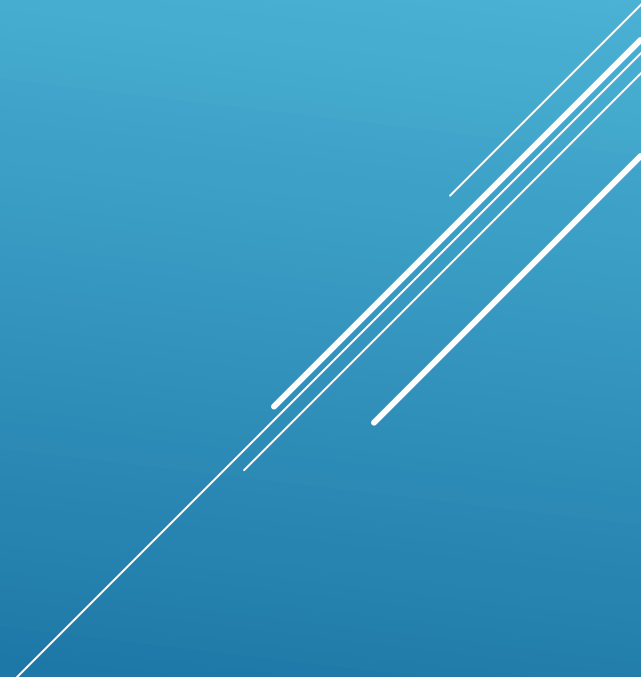
REPRESENTATION OF STANDARDIZED RESULTS IN CDISC STANDARDS

- Sometimes standardized results are known to exist for a QRS instrument, but not stated on the CRF. When this occurs, the standardized values will be represented in SDTM. As per CDISC QRS Best Practices and SDTMIG v3.4: “...This is only done when the numeric standardized responses are documented in the QRS CRF instructions, a user manual, a website specific to the QRS instrument, or another reference document that provides a clear explanation and rationale for providing them in the SDTMIG QRS dataset.”

RECAP OF CDISC REPRESENTATION OF QRS LOGICALLY SKIPPED ITEMS TO THIS POINT

- QSORRES, QSSTRESC, and QSSTRESN have been null because CDISC did not have a use case where standardized values were provided for items that were not done
- QSSTAT and QSREASND have been “NOT DONE” and “LOGICALLY SKIPPED ITEM”, respectively
 - Dilemma though because the sdTCG and CDISC standards were still out of sync
 - The standards provided no other solid way to represent that an item was conditionally branched

AN UPDATED RECOMMENDATION...



A NEW VARIABLE

- The CDISC SDS QRS Subteam is requesting a new variable; meanwhile a supplemental qualifier has been approved:

Name: QSCBRFL

Label: Conditional Branching Flag

Possible values of “Y” and null

- This will allow for indicating if an item has conditional branching
- The new standard variable, if approved, will be released in SDTMIG v4.0 and the corresponding SDTM v2.x.
- Meanwhile, the CDISC SDS QRS Subteam will use QSCBRFL as a non-standard variable.

A NEW APPROACH FOR ITEMS THAT ARE NOT DONE DUE TO CONDITIONAL BRANCHING: WHEN THERE ARE ASSIGNED VALUES

- Use the non-standard variable QSCBRFL (represented as suppqual until SDTMIG v4.0 is approved)
 - Do not use --STAT and --REASND
 - Do not use the derived flag, --DRVFL, as this is no longer needed given ADaM and Define-XML.
- 
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A NEW APPROACH FOR ITEMS THAT ARE NOT DONE DUE TO CONDITIONAL BRANCHING: WHEN THERE ARE **NOT** ASSIGNED VALUES

- Use QSCBRFL and do not use –DRVFL as when there are assigned values,
- DO Use --STAT and –REASND
- For REASND:
 - If there is a collected reason not done, use that
 - If there is no collected reason, either leave missing, or use the sponsor-defined reason not done per the sponsor's data management best practices (e.g., QSREASND = "LOGICALLY SKIPPED ITEM")

REQUESTED CHANGE TO THE FDA sDTCG

If instructions on how to record and/or score responses to items not done due to conditional branching are available from the instrument developer, then records for items with conditional branching should be included in the submission dataset with the following:

QSCBRFL = “Y”

QSORRES, QSSTRESC, and QSSTRESN would be assigned according to the instrument's instructions

REQUESTED CHANGE TO THE FDA sDTCG (CONT.)

If instructions on how to record and/or score responses to items not done due to conditional branching are not available from the instrument developer, then records for items with conditional branching should be included in the submission dataset with the following:

QSSTAT = “NOT DONE”,

QSREASND = either null or the sponsor-provided reason (e.g., “LOGICALLY SKIPPED ITEM”),

QSCBRFL = “Y” and,

QSORRES, QSSTRESC, and QSSTRESN all set to null.

EXAMPLE OF ITEMS WITH CONDITIONAL BRANCHING – PRO-CTCAE®

QSTESTCD=PT01014A and PT01014B

14. PRO-CTCAE™ Symptom Term: Hiccups

a. In the last 7 days, how OFTEN did you have HICCUPS?

☐ Never	☐ Rarely	☐ Occasionally	☐ Frequently	☐ Almost constantly
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b. In the last 7 days, what was the SEVERITY of your HICCUPS at their WORST?

☐ None	☐ Mild	☐ Moderate	☐ Severe	☐ Very severe
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When the PRO-CTCAE® is administered electronically, if the subject answers “Never” for PT01014A, then PT01014B is assigned “None”.

REPRESENTING ITEMS WITH CONDITIONAL BRANCHING - PRO-CTCAE®

*qs.xpt** - subject never having hiccups

Row	USUBJID	QSTESTCD	QSORRES	QSSTRESC	QSSTRESN	QSCBRFL
1	P0001	PT01014A	Never	0	0	
2	P0001	PT01014B	None	0	0	Y

- *Currently QSCBRFL would be represented as a non-standard variable (suppqual); in the future (SDTMIG v4.0; SDTM v2.x) it is anticipated to become a new standard variable.*
- *When the PRO-CTCAE is administered electronically, items not done due to conditional branching are assigned values of “None” or “Not at all” for QSORRES; QSSTRESC and QSSTRESN are assigned 0.*

**Due to space constraints, some variables are not shown in the qs.xpt table.*

EXAMPLE OF ITEMS WITH CONDITIONAL BRANCHING – FACT-C

Q2	Do you have an ostomy appliance? (Mark one box)	☐ No	or	☐ Yes			
	If yes, please answer the next two items:	When QSTESTCD=FAC00835, QSORRES = No/Yes and QSSTRESC = N/Y					
C8	I am embarrassed by my ostomy appliance ...	FAC00836	0	1	2	3	4
C9	Caring for my ostomy appliance is difficult ...	FAC00837	0	1	2	3	4

FAC00835 leads to two possible items not done due to conditional branching:

- FAC00836 and
- FAC00837

REPRESENTING ITEMS WITH CONDITIONAL BRANCHING – FACT-C

*qs.xpt** - with no ostomy appliance

Row	USUBJID	QSTESTCD	QSORRES	QSSTRESC	QSSTRESN
1	P0001	FAC00835	No	N	
2	P0001	FAC00836			
3	P0001	FAC00837			

qs.xpt (cont.)

Row	QSSTAT	QSREASND	QSCBRFL
1 (cont.)			
2 (cont.)	NOT DONE	LOGICALLY SKIPPED ITEM	Y
3 (cont.)	NOT DONE	LOGICALLY SKIPPED ITEM	Y

*Note:

- Due to space constraints, some variables are not shown in the *qs.xpt* table.
- Items skipped due to conditional branching are not scored for the FACT-C. If standardized values for items with conditional branching had been provided, then they would be represented in QSORRES, QSSTRESC, and QSSTRESN in Rows 2 and 3. QSREASND was not collected; however, the sponsor chose to represent it as “LOGICALLY SKIPPED ITEM” per data management best practices.

REPRESENTING ITEMS WITH CONDITIONAL BRANCHING – FACT-C (CONT.)

*qs.xpt** - with an ostomy appliance, answering all questions

Row	USUBJID	QSTESTCD	QSORRES	QSSTRESC	QSSTRESN	QSSTAT
1	P0001	FAC00835	Yes	Y		
2	P0001	FAC00836	Somewhat	2	2	
3	P0001	FAC00837	Quite a bit	3	3	

*Note: Due to space constraints, some variables are not shown in the *qs.xpt* table.

REPRESENTING ITEMS WITH CONDITIONAL BRANCHING – FACT-C (CONT.)

*qs.xpt** - with an ostomy appliance, but missing a response

Row	USUBJID	QSTESTCD	QSORRES	QSSTRESC	QSSTRESN	QSSTAT
1	P0001	FAC00835	Yes	Y		
2	P0001	FAC00836				NOT DONE
3	P0001	FAC00837	Quite a bit	3	3	

*Note: Due to space constraints, some variables are not shown in the *qs.xpt* table. QSREASND is not included as the reason there was no response is not known.

REPRESENTING ITEMS WITH CONDITIONAL BRANCHING – FACT-C (CONT.)

*qs.xpt** - missing all responses at the end of the FACT-C

Row	USUBJID	QSTESTCD	QSORRES	QSSTRESC	QSSTRESN	QSSTAT
1	P0001	FAC00835				NOT DONE
2	P0001	FAC00836				NOT DONE
3	P0001	FAC00837				NOT DONE

*Note: Due to space constraints, some variables are not shown in the *qs.xpt* table. QSREASND is not included as the reason there was no response is not known. All items, including the item that could lead to conditional branching, were left blank.

EXAMPLE OF ITEMS SKIPPED DUE TO CONDITIONAL BRANCHING - EXPANDED DRS-PI CAREGIVER VERSION, SECTION 2

2.0 Communication Ability QSSCAT=COMMUNICATION ABILITY			
2.1 Is [name] able to communicate with you in a way that you and others clearly understand? QSTESTCD=ED102_1	Consistently 0 Go to 2.2	Inconsistently 1 Go to 2.2	
2.2 How do they communicate primarily? QSTESTCD=ED102_2	0 Speech	1 Writing or spelling device	2 No Go to 2.4 3 Gestures or signals
2.3 Is [name] able to give the correct date and time within a few seconds of being asked? QSTESTCD=ED102_3	0 Yes	1 Yes but takes more than a few seconds	2 Sometimes
QSTESTCD=ED102_4	Go to #4	Go to #4	Go to #4
2.4 Does [name] have only a few words that [s/he] uses over and over or does [s/he] express him/herself <u>only</u> through random answers, shouting or swearing?	No 0 Go to 2.5	Yes 1 Go to #4	
2.5 Does [name] only moan, groan or make other sounds that are not understandable? QSTESTCD=ED102_5	No 0 Go to #4	Yes 1 Go to #4	

When EDR102_1 is “Consistently” or “Inconsistently”, then items ED102_4 and ED102_5 are skipped.

When EDR102_1 is “No”, then items ED102_2 and ED102_3 are skipped.

When ED102_4 is “Yes”, then item ED102_5 is skipped.

To examiner: There is no item #3. Go to #4.

EXAMPLE OF ITEMS SKIPPED DUE TO CONDITIONAL BRANCHING - EXPANDED DRS-PI CAREGIVER VERSION, SECTION 2 (CONT.)

*qs.xpt** (with ED102_1 = "Consistently")

Row	USUBJID	QSTESTCD	QSORRES	QSSTRESC	QSSTRESN
1	P0001	ED102_1	Consistently	0	0
2	P0001	ED102_2	Speech	0	0
3	P0001	ED102_3	Yes, but takes more than a few seconds	1	1
4	P0001	ED102_4			
5	P0001	ED102_5			

qs.xpt (cont.)

Row	QSSTAT	QSCBRFL
1 (cont.)		
2 (cont.)		
3 (cont.)		
4 (cont.)	NOT DONE	Y
5 (cont.)	NOT DONE	Y

*Note:

- Items not done due to conditional branching are not scored for the Expanded DRS-PI. If standardized values for these items had been provided, then QSORRES, QSSTRESC, and QSSTRESN would have been populated in Rows 4 and 5. The sponsor chose not to use QSREASND since QSCBRFL shows there was conditional branching.

*Note: Due to space constraints, some variables are not shown in the *qs.xpt* table.

EXAMPLE OF ITEMS SKIPPED DUE TO CONDITIONAL BRANCHING - EXPANDED DRS-PI CAREGIVER VERSION, SECTION 2 (CONT.)

*qs.xpt** (with ED102_1 = "No")

Row	USUBJID	QSTESTCD	QSORRES	QSSTRESC	QSSTRESN
1	P0001	ED102_1	No	2	2
2	P0001	ED102_2			
3	P0001	ED102_3			
4	P0001	ED102_4	Yes	1	1
5	P0001	ED102_5			

qs.xpt (cont.)

Row	QSSTAT	QSCBRFL
1 (cont.)		
2 (cont.)	NOT DONE	Y
3 (cont.)	NOT DONE	Y
4 (cont.)		
5 (cont.)	NOT DONE	Y

*Note:

- Items not done due to conditional branching are not scored for the Expanded DRS-PI. If standardized values for these items had been provided, then QSORRES, QSSTRESC, and QSSTRESN would have been populated in Rows 2, 3, and 5. The sponsor chose not to use QSREASND since QSCBRFL shows there was conditional branching.

* Note: Due to space constraints, some variables are not shown in the *qs.xpt* table.

EXAMPLE OF ITEMS SKIPPED DUE TO CONDITIONAL BRANCHING - EXPANDED DRS-PI CAREGIVER VERSION, SECTION 8

How certain are you that [name] can:

	Certain or very certain s/he can	Uncertain	Certain or very certain s/he cannot
8.4 perform in a wide variety of jobs of [his/her] choosing or manage a home independently or participate in school full-time QSTESTCD=ED108_4	0	1	2
	END	Go to 8.5	
8.5 be successful at work, school or in home management with some reduction in the work load or with other accommodations due to disabilities QSTESTCD=ED108_5	0	1	2
	END	Go to 8.6	
8.6 be successful at work, school or in home management but with limited choices in jobs or school courses due to disabilities QSTESTCD=ED108_6	0	1	2
	END	Go to 8.7	
8.7 be able to work at home or in a special setting like a sheltered workshop in which the work is very routine and there is very frequent supervision and support QSTESTCD=ED108_7	0	1	2
	END	END	

ED108_4, ED108_5, and ED108_6 can each lead to items being skipped due to conditional branching when the response is "Certain or very certain s/he can".

EXAMPLE OF ITEMS SKIPPED DUE TO CONDITIONAL BRANCHING - EXPANDED DRS-PI CAREGIVER VERSION, SECTION 8 (CONT.)

*qs.xpt**

Row	USUBJID	QSTESTCD	QSORRES	QSSTRESC	QSSTRESN
1	P0001	ED108_4	Uncertain	1	1
2	P0001	ED108_5	Certain or very certain s/he can	0	0
3	P0001	ED108_6			
4	P0001	ED108_7			

qs.xpt (cont.)

Row	QSSTAT	QSCBRFL
1 (cont.)		
2 (cont.)		
3 (cont.)	NOT DONE	Y
4 (cont.)	NOT DONE	Y

*Note:

- Items not done due to conditional branching are not scored for the Expanded DRS-PI. If standardized values for these items had been provided, then QSORRES, QSSTRESC and QSSTRESN would have been in Rows 3 and 4. The sponsor chose not to use QSREASND since QSCBRFL shows there was conditional branching.

* Note: Due to space constraints, some variables are not shown in the *qs.xpt* table.

EXAMPLE OF ITEMS WITH CONDITIONAL BRANCHING – IDS-C

Complete either 11 or 12 (not both)

11. Appetite (Decreased): **RSTESTCD=IDSC111**

- 0 No change from usual appetite.
- 1 Eats somewhat less often and/or lesser amounts than usual.
- 2 Eats much less than usual and only with personal effort.
- 3 Eats rarely within a 24-hour period, and only with extreme personal effort or with persuasion by others.

12. Appetite (Increased): **RSTESTCD=IDSC112**

- 0 No change from usual appetite.
- 1 More frequently feels a need to eat than usual.
- 2 Regularly eats more often and/or greater amounts than usual.
- 3 Feels driven to overeat at and between meals.

- Data needs cleaning if IDSC111/IDSC112 conflict
- A record is created for both items.
- The item that does not apply is considered to be not done due to conditional branching.

EXAMPLE OF ITEMS WITH CONDITIONAL BRANCHING – IDS-C

rs.xpt

Row	USUBJID	RSTESTCD	RSORRES	RSSTRESC	RSSTRESN
11	P0001	IDSC111	No change from usual appetite.	0	0
12	P0001	IDSC112			

rs.xpt (cont.)

Row	RSSTAT	RSCBRFL
11 (cont.)		
12 (cont.)	NOT DONE	Y

*Note:

- Items not done due to conditional branching are not scored for the IDS-C. If standardized values for these items had been provided, then RSORRES, RSSTRESC, and RSSTRESN would have been populated in Row 12. The sponsor chose not to use QSREASND since QSCBRFL shows there was conditional branching.

* Note: Due to space constraints, some variables are not shown in the *rs.xpt* table

EXAMPLE OF ITEMS WITH CONDITIONAL BRANCHING – PHQ-15

	Not bothered at all (0)	Bothered a little (1)	Bothered a lot (2)
QSTESTCD =PHQ0204 d. Menstrual cramps or other problems with your periods WOMEN ONLY	☐	☐	☐

- Data needs cleaning if PHQ0204 is answered for “Male” subjects.
- If the item does not apply, it is considered to be not done due to conditional branching.

REPRESENTING ITEMS WITH CONDITIONAL BRANCHING – PHQ-15

qs.xpt (female respondent for which this applies)*

Row	USUBJID	QSTESTCD	QSORRES	QSSTRESC	QSSTRESN	QSSTAT
1	P0001	PHQ0204	Not bothered at all	0	0	

qs.xpt (male respondent, menopausal woman, someone that does not use traditional gender identification, etc.)

Row	USUBJID	QSTESTCD	QSORRES	QSSTRESC	QSSTRESN
4	P0004	PHQ0204			

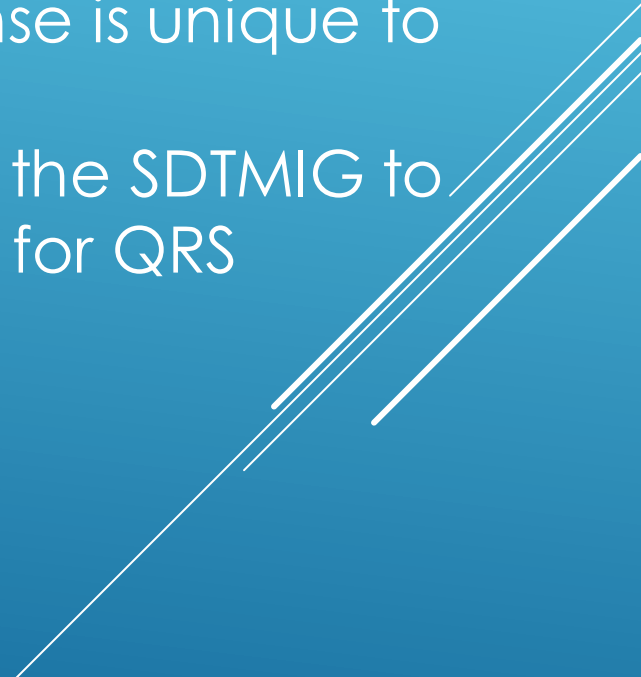
qs.xpt (cont.)

Row	QSSTAT	QSCBRFL	QSREASND
4 (cont.)	NOT DONE	Y	CONDITIONAL BRANCHING

Notes:

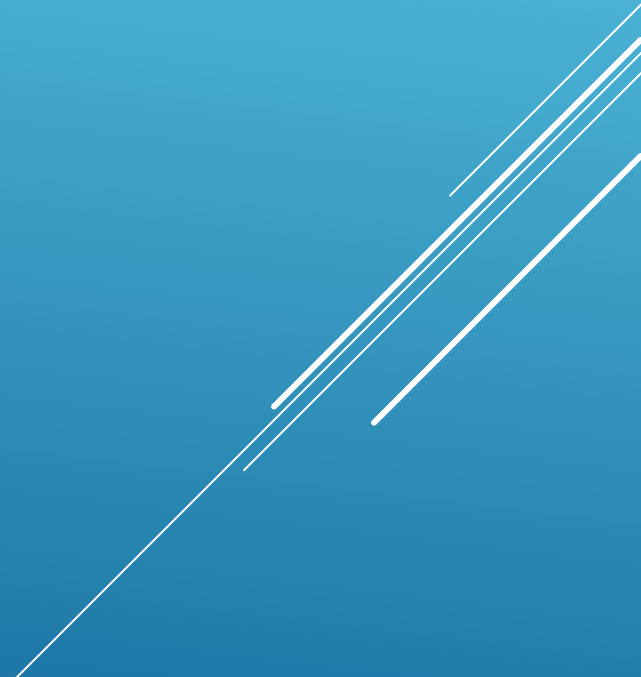
- Due to space constraints, some variables are not shown in the *qs.xpt* table.
- Items not done due to conditional branching are not scored for the PHQ-15. If standardized values for these items had been provided, then QSORRES, QSSTRESC, and QSSTRESN would have been populated in Row 4. The sponsor chose to represent the reason not done as “CONDITIONAL BRANCHING” per their data management best practices.

Final notes regarding representing missing data in QS/RS/FT

- Providing records for items with no response is unique to QRS domains (QS, RS, and FT).
 - The SDS QRS Subteam is working to revise the SDTMIG to reflect the representation of missing data for QRS instruments.
- 
- Several white lines of varying lengths and slopes are positioned in the bottom right corner of the slide, creating a modern, abstract graphic element.

- ▶ Dana Booth
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- ▶ Steve Kopko
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THANK YOU!

Several thin, parallel white lines of varying lengths and slopes are positioned in the bottom right corner of the slide, creating a modern, abstract graphic element.