

A Novel Approach for the Algorithmic FMQ Analysis Dataset (ADALGFMQ)

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Meet the Speaker

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Jiaonan Li is Senior Scientist at MSD China's Statistical Programming Group with approximately 8 years of experience in the pharmaceutical industry. She has a variety of work experience with Late-stage oncology study, Early-stage oncology study, ISS study and regulatory submission. Jiaonan holds an MS degree in Biostatistics from the University of Southern California and a BS degree in Biology Science from Jinan University.



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- The views and opinions expressed in this presentation are those of the author(s) and do not necessarily reflect the official policy or position of CDISC.
- The author(s) have no real or apparent conflicts of interest to report.



Agenda

- 1. Introduction
- 2. Proposal for the Algorithmic FMQ Analysis Dataset
- 3. Summary





- U.S. Food and Drug Administration (FDA) released a draft guidance on standard safety tables and figures (ST&F) in August 2022, which includes 19 of them related to FDA Medical Queries (FMQs).
- The FMQs are standardized groupings of related Medical Dictionary for Regulatory Activities (MedDRA) preferred terms (PTs).
- Algorithmic FMQs (ALGFMQs) are an important step forward in signal detection, as these include data from:
 - Adverse Event
 - Laboratory
 - Concomitant Medications
 - Medical History
 - > Temporal relationships







- Four algorithmic FMQs* have been developed:
 - Rhabdomyolysis and other muscle injury
 - Hypoglycemia
 - Hyperglycemia
 - Hypersensitivity

*Algorithmic FMQs are still in development and will be updated as more experience is gained by using them in NDA/BLA safety evaluations.



Mockup of Rhabdomyolysis and Other Muscle Injury

- > 4 Algorithmic FMQ Criteria
- Count participants per criterion and calculate risk difference

 Table 39. Patients With Rhabdomyolysis and Other Muscle Injury Algorithmic FDA Medical Query,
 Safety Population, Pooled Analysis (or Trial X)

Algorithmic FMQ Criterion	Drug Name Dose X N = XXX N (%)	Drug Name Dose Y N = XXX N (%)	Control N = XXX N (%)	Risk Difference (%) (95% CI) ^{1,4}
Patients with ≥1 Algorithmic Criterion	n(%)	n(%)	n(%)	X (Y, Z)
Any Rhabdomyolysis FMQ Narrow	n(%)	n(%)	n(%)	X (Y, Z)
Urine myoglobin > ULN	n(%)	n(%)	n(%)	X (Y, Z)
CPK >5 x ULN ²	n(%)	n(%)	n(%)	X (Y, Z)
Myalgia + Weakness + Chromaturia ³	n(%)	n(%)	n(%)	X (Y, Z)

Source: [include Applicant source, datasets and/or software tools used].

¹Difference is shown between [treatment arms].

²NO CPK-MB/CPK >0.05 within 3 days NOR CPK > ULN at baseline.

³ [PT Myalgia + PT Muscular Weakness + (PT Myoglobin Urine Present OR PT Chromaturia)] within 7 days.

⁴ Table display is ordered by the risk difference.

Abbreviations: CI, confidence interval; CPK, creatine phosphokinase; FMQ, FDA Medical Query; N, number of patients in group; n, number of patients meeting criteria; PT, preferred term, ULN, upper limit of normal



Mockup of Hypoglycemia

Subgroup analysis

COISC

- ✓ No History of Diabetes
- ✓ History of Diabetes

> 4 Algorithmic FMQ Criteria

Table 40. Patients With Hypoglycemia Algorithmic FDA Medical Query, Safety Population	, Pooled
Analysis (or Trial X)	

	Drug Name		Risk
	Dosage X	Placebo	Difference
Population	N = XXX	N = XXX	(%)
Algorithmic FMQ Criterion	n (%)	n (%)	(95% CI) ¹
Safety Population	n(%)	n(%)	
Patients with ≥ 1 Algorithmic Criterion	n(%)	n(%)	X (Y, Z)
Any Hypoglycemia FMQ Narrow Term	n(%)	n(%)	X (Y, Z)
Plasma Glucose < 54 mg/dL	n(%)	n(%)	X (Y, Z)
Hypoglycemia Term ² + Plasma Glucose < 70 mg/dL ³	n(%)	n(%)	X (Y, Z)
≥ 2 Hypoglycemia Terms² + ≥ 2 Episodes of Plasma	n(%)	n(%)	X (Y, Z)
Glucose < 70 mg/dL			
No History of Diabetes	n(%)	n(%)	
Patients with ≥ 1 Algorithmic Criterion	n(%)	n(%)	X (Y, Z)
Any Hypoglycemia FMQ Narrow Term	n(%)	n(%)	X (Y, Z)
Plasma Glucose < 54 mg/dL	n(%)	n(%)	X (Y, Z)
Hypoglycemia Term ² + Plasma Glucose < 70 mg/dL ³	n(%)	n(%)	X (Y, Z)
≥ 2 Hypoglycemia Terms ² + ≥ 2 Episodes of Plasma	n(%)	n(%)	X (Y, Z)
Glucose < 70 mg/dL			
History of Diabetes	n(%)	n(%)	
Patients with ≥ 1 Algorithmic Criterion	n(%)	n(%)	X (Y, Z)
Any Hypoglycemia FMQ Narrow Term	n(%)	n(%)	X (Y, Z)
Plasma Glucose < 54 mg/dL	n(%)	n(%)	X (Y, Z)
Hypoglycemia Term² + Plasma Glucose < 70 mg/dL³	n(%)	n(%)	X (Y, Z)
≥ 2 Hypoglycemia Terms ² + ≥ 2 Episodes of Plasma	n(%)	n(%)	X (Y, Z)
Glucose < 70 mg/dL			

Source: [include Applicant source, datasets and/or software tools used].

¹Difference is shown between [treatment arms].

² Includes any Hypoglycemia FMQ Broad term that is not a Hypoglycemia FMQ Narrow term or any of the following supplemental terms: accident, anxiety, asthenia, balance disorder, cold sweat, coma, confusional state, coordination abnormal, dysarthria, fall, fatigue, headache, hunger, hyperhidrosis, irritability, loss of consciousness, palpitations, road traffic accident, seizure, tremor, vision blurred, and visual impairment.

³Hypoglycemia Term and Plasma Glucose level must occur within 7 days of each other.

Abbreviations: CI, confidence interval; FMQ, FDA Medical Query; N, number of patients in group; n, number of patients meeting criteria; PT, preferred term



Mockup of Hyperglycemia

Subgroup analysis

cdisc

- ✓ No History of Diabetes
- ✓ History of Diabetes

> 7 Algorithmic FMQ Criteria

Table 41	. Patients With	hyperglycemia	Algorithmic FDA	Medical Qu	uery, Safety l	Population,	Pooled
Analysis	(or Trial X)						

	Drug		
	Name		Risk
	Dosage X	Placebo	Difference
Population	N = XXX	N = XXX	(%)
Ålgorithmic FMQ Criterion	n (%)	n (%)	(95% ČI) ¹
Safety Population	n(%)	n(%)	
Patients with ≥ 1 Algorithmic Criterion	n(%)	n(%)	X (Y, Z)
Any Hyperglycemia FMQ Narrow term	n(%)	n(%)	X (Y, Z)
Fasting Plasma Glucose ≥ 126 mg/dL	n(%)	n(%)	X (Y, Z)
≥ 2 Plasma Glucoses > 180 mg/dL	n(%)	n(%)	X (Y, Z)
Any New Diabetes Concomitant Medication	n(%)	n(%)	X (Y, Z)
Post Baseline HbA1c≥6.5%	n(%)	n(%)	X (Y, Z)
HbA1c Increase ≥ 0.3% with Post Baseline HbA1c ≥ 5.7%	n(%)	n(%)	X (Y, Z)
Change from Baseline Fasting Plasma Glucose ≥ 20	n(%)	n(%)	X (Y, Z)
mg/dL with Post Baseline Fasting Plasma Glucose >			
100 mg/dL			
No History of Diabetes	n(%)	n(%)	
Patients with ≥ 1 Algorithmic Criterion	n(%)	n(%)	X (Y, Z)
Any Hyperglycemia FMQ Narrow term	n(%)	n(%)	X (Y, Z)
Fasting plasma glucose ≥ 126 mg/dL	n(%)	n(%)	X (Y, Z)
≥ 2 Plasma Glucoses > 180 mg/dL	n(%)	n(%)	X (Y, Z)
Any New Diabetes Concomitant Medication	n(%)	n(%)	X (Y, Z)
Post Baseline HbA1c≥6.5%	n(%)	n(%)	X (Y, Z)
HbA1c Increase ≥ 0.3% with Post Baseline HbA1c ≥ 5.7%	n(%)	n(%)	X (Y, Z)
Change from Baseline Fasting Plasma Glucose ≥ 20	n(%)	n(%)	X (Y, Z)
mg/dL with Post Baseline Fasting Plasma Glucose > 100			
mg/dL			
History of Diabetes	n(%)	n(%)	
Patients with \geq 1 Algorithmic Criterion	n(%)	n(%)	X (Y, Z)
Any Hyperglycemia FMQ Narrow term	n(%)	n(%)	X (Y, Z)
Fasting plasma glucose ≥ 126 mg/dL	n(%)	n(%)	X(Y, Z)
≥ 2 Plasma Glucoses > 180 mg/dL	n(%)	n(%)	X(Y, Z)
Any New Diabetes Concomitant Medication	n(%)	n(%)	X (Y, Z)
Post Baseline HbA1c≥6.5%	n(%)	n(%)	X(Y, Z)
HbA1c increase $\ge 0.3\%$ with Post Baseline HbA1c $\ge 5.7\%$	n(%)	n(%)	X(Y, Z)
Change from Baseline Fasting Plasma Glucose ≥ 20	n(%)	n(%)	X (Y, Z)
mg/dL with Post Baseline Fasting Plasma Glucose > 100			
ma/dL			

Source: [include Applicant source, datasets and/or software tools used].

¹ Difference is shown between [treatment arms].

² Table display is ordered by the risk difference.

Abbreviations: CI, confidence interval; FMQ, FDA Medical Query; N, number of patients in treatment arm; n, number of patients with adverse event



- Mockup of Hypersensitivity
 - 4 Algorithmic FMQ Criteria \geq

	Drug Name	Drug Name	Active	
	Dose X	Dose Y	Control	Risk
Algorithmic FMQ	N = XX	N = XX	N = XX	Difference
Criterion	n(%)	n(%)	n(%)	(95% CI) ^{1,3}
Patients with ≥1 Algorithmic Criterion ²	n(%)	n(%)	n(%)	X (Y, Z)
Any hypersensitivity FMQ narrow term	n(%)	n(%)	n(%)	X (Y, Z)
Respiratory + Skin Reaction	n(%)	n(%)	n(%)	X (Y, Z)
Respiratory + Systemic Reaction	n(%)	n(%)	n(%)	X (Y, Z)
Skin + Systemic Reaction	n(%)	n(%)	n(%)	X (Y, Z)

Table 12 Patients V	Nith Algorithmic	Hypersensitivit	v EDA Medical (Query Safe	ty Population	Trial Y
Table 42. Fallellis V	viui Aigoriunnic	пурегзенынин	y FDA Meulcal V	Query, Sale	ly Population,	

Source: [include Applicant source, datasets and/or software tools used].

¹ Difference is shown between [treatment arms]. ² Combinations of events must occur within 7 days of each other to qualify

³Table display is ordered by the risk difference.

Abbreviations: CI, confidence interval; FMQ, FDA Medical Query; N, number of patients in treatment arm; n, number of patients with adverse event





Proposal 1: Specification

BDS I Key variables:

- PARAM: ALGFMQ criterion
- PARCAT1: ALGFMQ
- PARAMCD: assigned value
- AVALC: Set to 'Yes'

Variable Name	Variable Label	Туре	Derivation
All core variable	es should be carried over from ADSL		
DIABETFL	History of Diabetes	Char	ADSL.DIABETFL
			This variable is needed in FMQ (Hypersensitivity) related analysis table.
ASTDT	Analysis Start Date	integer	See Value-level Metadata
ASTDY	Analysis Start Relative Day	integer	ASTDT-TRTSDT + 1
PARAM	Parameter	Char	See Value-level Metadata
PARAMCD	Parameter Code	Char	See Value-level Metadata
PARAMN	Parameter (N)	integer	Derived at study level, depending on the sorting order required
PARCAT1	Parameter Category 1	Char	See Value-level Metadata
PARCAT1N	Parameter Category 1 (N)	integer	1=Rhabdomyolysis
			2=Hypoglycemia
			3=Hyperglycemia
			4=Hypersensitivity
AVALC	Analysis Value (C)	Char	Set to 'Yes'
HYPSCAT	Hypersensitivity Category	Char	Determine if Hypersensitivity belong to category A, B, C, or D per FDA FMQ master file.
SRCVALUE	Source Value	Char	The source value that used in derived ATERM
SRCVAR	Source Variable	Char	The name of source variable used to derive ATERM
SRCDOM	Source Data	Char	The name of source dataset that used to derive ATERM. If multiple source datasets are
			used, set NULL.
SRCSEQ	Source Sequence Number	integer	The sequence numberSEQ or ASEQ of the row (in the domain or dataset identified
			by SRCDOM) that relates to the analysis variable (ATERM).
ASPID	Analysis Identifier	Char	See Value-level Metadata
ARELID	Analysis Relatioship Identifier	Char	See Value-level Metadata



Proposal 1: Value-level Metadata

PARCAT1	PARCAT1N	PARAMCD	PARAM	PARAMN	ASTDT	ASPID	ARELID	Derivation
Hypoglycemia	2	НҮРО	Any Hypoglycemia FMQ Narrow Term	21	ADAEFMQ.ASTDT	Set to missing	Set to missing	If ADAEFMQ.FMQNAM="Hypoglycemia" and ADAEFMQ.FMQCLASS="Narrow", then set PARAMCD = 'HYPO', PARAMIN = 21, PARAM='Any Hypoglycemia FMQ narrow term: Create a record
Hypoglycemia	2	PGLU	Plasma Glucose < 54 mg/dL	22	ADLB.ADT	Set to missing	Set to missing	From ADLB dataset. When ADLB.LCSPEC='PLASMA' and ADLB.PARAMCD='GLUC' and ADLB.AVALU='mg/dL' and ADLB.AVAL < 54, then set PARAMCD = 'PGLU', PARAMN = 22, PARAM='Plasma Glucose < 54 mg/dL'. Create a record
Hypoglycemia	2	нүрот	Hypoglycemia Term	231	ADAEFMQ.ASTDT/ ADAE.ASTDT	For each participant, assign a sequencial number (seq) starting from 1 to n (n is number of records of PARAMN=231). ASPID is created by concatenating PARAMN and seq by dash (-').	Set to missing	If ((ADAEFMQ.FMQNAM="Hypoglycemia" and ADAEFMQ.FMQCLASS="Broad") or ADAE.AEDECOD in Accident, Anxiety, Asthenia, Cold sweat, Coma, Confusional state, Fall, Fatigue, Hunger, Hyperhidrosis, Irritability, Loss of consciousness, Palpitations, Road traffic accident, Seizure, Tremor, Dysarthria, Balance disorder, Coordination abnormal, Headache, Vision blurred, and Visual impairment)), then set PARAMCD = HYPOT, PARAMN=231, PARAM = "Hypoglycemia Term"
Hypoglycemia	2	PGLUS	Plasma Glucose < 70 mg/dL	232	ADLB.ADT	For each participant, assign a sequencial number (seq) starting from 1 to n (n is number of records of PARAMN=232). ASPID is created by concatenating PARAMN and seq by dash (-2).	Set to missing	If ADLB PARAMCD='GLUC' and ADLB LBSPEC='PLASMA' and ADLB AVALU='mg/dL' and ADLB AVAL <70, then set PARAMCD = 'PGLUS', PARAMN=232, PARAM='Plasma Glucose < 70 mg/dL'
Hypoglycemia	2	HYPOPGLU	Hypoglycemia Term + Plasma Glucose < 70 mg/dL	23	Minimum of ASTDT that linked to the event used to derive	Set to missing	ARELID is created by concatenating the corresponding ASPID from PARAMN=231 and 232, separated by comma (",");	If a participant has both one record from PARAMN=231 and one record from PARAMN=232 with ADLB.ADT (from PARAMN=232) within 1 week of the AE (from PARAMN=231), then set PARAMCD = 'HYPOPGLU', PARAMN = 23, PARAM=Hypoglycemia Term + Plasma Glucose < 70 mg/dL': Create a record
Hypoglycemia	2	HYPOEGLU	>= 2 Hypoglycemia Terms + >= 2 Episodes of Plasma Glucose < 70 mg/dL	24	Minimum of ASTDT that linked to the event used to derive	Set to missing	ARELID is created by concatenating the corresponding ASPID from PARAMN=231 and 233, separated by comma (",");	if a participant has more than 1 record from PARAMN=231 and more than 1 record from PARAMN=232, then set PARAMCD = 'HYPOEGLU', PARAMN = 24, PARAM= '>= 2 Hypoglycemia Terms + >= 2 Episodes of Plasma Glucose < 70 mg/dL': Create a record



Proposal 1: Sample Dataset

			•				•								
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USUBJID	ASTDT	PARAM	PARAMCD	PARAMN	PARCAT1	PARCAT1N	AVALC	HYPSCAT	SRCVALUE	SRCVAR	SRCDOM	SRCSEQ	ASPID	ARELID	
3002	5/2/2023	Any Hypoglycemia FMQ Narrow Term	НҮРО	21	Hypoglycemia	2	YES		Hypoglycemia	FMQNAM	ADAEFMQ	39			
3002	5/21/2023	Any Hypoglycemia FMQ Narrow Term	НҮРО	21	Hypoglycemia	2	YES		Hypoglycemia	FMQNAM	ADAEFMQ	48			
3002	5/3/2023	Plasma Glucose < 54 mg/dL	PGLU	22	Hypoglycemia	2	YES		32	AVAL	ADLB	100			
3002	5/2/2023	Hypoglycemia Term	HYPOT	231	Hypoglycemia	2	YES		Hypoglycemia	FMQNAM	ADAEFMQ	40	231-1		
3002	5/5/2023	Hypoglycemia Term	HYPOT	231	Hypoglycemia	2	YES		Fatigue	AEDECOD	ADAE	930	231-2		
3002	5/3/2023	Plasma Glucose < 70 mg/dL	PGLUS	232	Hypoglycemia	2	YES		32	AVAL	ADLB	100	232-1		
3002	5/2/2023	Hypoglycemia Term + Plasma Glucose < 70 mg/dL	HYPOPGLU	23	Hypoglycemia	2	YES							231-1,232-1	
3002		>=2 Hypoglycemia Terms + >=2 Episodes of Plasma Glucose < 70 mg/dL	HYPOEGLU	24	Hypoglycemia	2	YES	This record wi	ll not be populated	in dataset sind	e no criteria m	et			

Intermediate records to enhance traceability

Proposal 1: Specifi	cation			
BDS I Key variables	VALUES NO.	Yearcas	1 3=	1 Sente
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Proposal 1:

Each ALGFMQ criterion is set as a PARAM. PARAM is the target analysis variable.





Proposal 2: Specification

BDS II Key variables:

- PARAM: ALGFMQ
- PARAMCD: assigned value
- AVALC: ALGFMQ criterion
- AVAL: assigned numeric value

Variable Name	Variable Label	Туре	Derivation
All core variable	es should be carried over from ADSL		
DIABETFL	History of Diabetes	Char	ADSL.DIABETFL
			This variable is needed in FMQ (Hypersensitivity) related analysis table.
ASTDT	Analysis Start Date	integer	See Value-level Metadata
ASTDY	Analysis Start Relative Day	integer	ASTDT-TRTSDT + 1
PARAM	Parameter	Char	See Value-level Metadata
PARAMCD	Parameter Code	Char	See Value-level Metadata
PARAMN	Parameter (N)	integer	See Value-level Metadata
AVALC	Analysis Value (C)	Char	See Value-level Metadata
AVAL	Analysis Value (C)	Char	See Value-level Metadata
HYPSCAT	Hypersensitivity Category	Char	Determine if Hypersensitivity belong to category A, B, C, or D per
			FDA FMQ master file.
SRCVALUE	Source Value	Char	The source value that used in derived ATERM
SRCVAR	Source Variable	Char	The name of source variable used to derive ATERM
SRCDOM	Source Data	Char	The name of source dataset that used to derive ATERM. If
			multiple source datasets are used, set NULL.
SRCSEQ	Source Sequence Number	integer	The sequence numberSEQ or ASEQ of the row (in the domain
			or dataset identified by SRCDOM) that relates to the analysis
			variable (ATERM).
ASPID	Analysis Identifier	Char	See Value-level Metadata
ARELID	Analysis Relatioship Identifier	Char	See Value-level Metadata



Proposal 2: Value-level Metadata

1	PARAM	PARAMN	PARAMCD	AVALC	AVAL	ASTDT	ASPID	ARELID
8 1	Hypoglycemia	2	HYPOG	If ADAEFMQ.FMQNAM="Hypoglycemia" and	If ADAEFMQ.FMQNAM="Hypoglycemia" and	If ADAEFMQ.FMQNAM="Hypoglycemia" and	If ADAEFMQ.FMQNAM="Hypoglycemia" and	If ADAEFMQ.FMQNAM="Hypoglycemia" and
•				ADAEFMQ.FMQCLASS="Narrow", then Any	ADAEFMQ.FMQCLASS="Narrow", then 21;	ADAEFMQ.FMQCLASS="Narrow", then	ADAEFMQ.FMQCLASS="Narrow", then set to missing;	ADAEFMQ.FMQCLASS="Narrow", then set to
:				Hypoglycemia FMQ Narrow Term;	From ADLB dataset. When	ADAEFMQ.ASTDT;	From ADLB dataset. When ADLB.LCSPEC='PLASMA' and	missing;
				From ADLB dataset. When	ADLB.LCSPEC='PLASMA' and	From ADLB dataset. When	ADLB.PARAMCD='GLUC' and ADLB.AVALU='mg/dL' and	From ADLB dataset. When ADLB.LCSPEC='PLASMA'
1				ADLB.LCSPEC='PLASMA' and	ADLB.PARAMCD='GLUC' and	ADLB.LCSPEC='PLASMA' and	ADLB.AVAL < 54, then set to missing;	and ADLB.PARAMCD='GLUC' and
				ADLB.PARAMCD='GLUC' and ADLB.AVALU='mg/dL'	ADLB.AVALU='mg/dL' and ADLB.AVAL < 54, then	ADLB.PARAMCD='GLUC' and	If ((ADAEFMQ.FMQNAM="Hypoglycemia" and	ADLB.AVALU='mg/dL' and ADLB.AVAL < 54, then set
.				and ADLB.AVAL < 54, then 'Plasma Glucose < 54	22;	ADLB.AVALU='mg/dL' and ADLB.AVAL < 54,	ADAEFMQ.FMQCLASS="Broad") or ADAE.AEDECOD in	to missing;
8				mg/dL': Create a record;	If ((ADAEFMQ.FMQNAM="Hypoglycemia" and	then ADLB.ADT;	Accident, Anxiety, Asthenia, Cold sweat, Coma,	If ((ADAEFMQ.FMQNAM="Hypoglycemia" and
2				If ((ADAEFMQ.FMQNAM="Hypoglycemia" and	ADAEFMQ.FMQCLASS="Broad") or	If ((ADAEFMQ.FMQNAM="Hypoglycemia" and	Confusional state, Fall, Fatigue, Hunger, Hyperhidrosis,	ADAEFMQ.FMQCLASS="Broad") or ADAE.AEDECOD
				ADAEFMQ.FMQCLASS="Broad") or	ADAE.AEDECOD in Accident, Anxiety, Asthenia,	ADAEFMQ.FMQCLASS="Broad") or	Irritability, Loss of consciousness, Palpitations, Road	in Accident, Anxiety, Asthenia, Cold sweat, Coma,
•				ADAE.AEDECOD in Accident, Anxiety, Asthenia,	Cold sweat, Coma, Confusional state, Fall,	ADAE.AEDECOD in Accident, Anxiety,	traffic accident, Seizure, Tremor, Dysarthria, Balance	Confusional state, Fall, Fatigue, Hunger,
				Cold sweat, Coma, Confusional state, Fall, Fatigue,	Fatigue, Hunger, Hyperhidrosis,	Asthenia, Cold sweat, Coma, Confusional	disorder, Coordination abnormal, Headache, Vision	Hyperhidrosis,
				Hunger, Hyperhidrosis,	Irritability, Loss of consciousness, Palpitations,	state, Fall, Fatigue, Hunger, Hyperhidrosis,	blurred, and Visual impairment)), then for each	Irritability, Loss of consciousness, Palpitations,
8				Irritability, Loss of consciousness, Palpitations,	Road traffic accident, Seizure, Tremor,	Irritability, Loss of consciousness,	participant, assign a sequencial number (seq) starting	Road traffic accident, Seizure, Tremor, Dysarthria,
•				Road traffic accident, Seizure, Tremor, Dysarthria,	Dysarthria, Balance disorder, Coordination	Palpitations, Road traffic accident, Seizure,	from 1 to n (n is number of records of PARAMN=231).	Balance disorder, Coordination abnormal,
1				Balance disorder, Coordination abnormal,	abnormal, Headache, Vision blurred, and Visual	Tremor, Dysarthria, Balance disorder,	ASPID is created by concatenating PARAMN and seq by	Headache, Vision blurred, and Visual impairment)),
4				Headache, Vision blurred, and Visual impairment)	impairment)), then 231;	Coordination abnormal, Headache, Vision	dash ('-');	then set to missing;
), then 'Hypoglycemia Term';	If ADLB.PARAMCD='GLUC' and	blurred, and Visual impairment)), then	If ADLB.PARAMCD='GLUC' and ADLB.LBSPEC='PLASMA'	If ADLB.PARAMCD='GLUC' and
				If ADLB.PARAMCD='GLUC' and	ADLB.LBSPEC='PLASMA' and	ADAEFMQ.ASTDT/ADAE.ASTDT;	and ADLB.AVALU='mg/dL' and ADLB.AVAL <70, then for	ADLB.LBSPEC='PLASMA' and ADLB.AVALU='mg/dL'
8				ADLB.LBSPEC='PLASMA' and	ADLB.AVALU='mg/dL' and ADLB.AVAL <70, then	If ADLB.PARAMCD='GLUC' and	each participant, assign a sequencial number (seq)	and ADLB.AVAL <70, then set to missing;
2				ADLB.AVALU='mg/dL' and ADLB.AVAL <70, then	232;	ADLB.LBSPEC='PLASMA' and	starting from 1 to n (n is number of records of	If a participant has both one record from
•				"Plasma Glucose < 70 mg/dL";	If a participant has both one record from	ADLB.AVALU='mg/dL' and ADLB.AVAL <70,	PARAMN=232). ASPID is created by concatenating	PARAMN=231 and one record from PARAMN=232
1				If a participant has both one record from	PARAMN=231 and one record from	then ADLB.ADT;	PARAMN and seq by dash ('-');	with ADLB.ADT (from PARAMN=232) within 1 week of
•				PARAMN=231 and one record from PARAMN=232	PARAMN=232 with ADLB.ADT (from	If a participant has both one record from	If a participant has both one record from PARAMN=231	the AE (from PARAMN=231), then ARELID is created
				with ADLB.ADT (from PARAMN=232) within 1 week	PARAMN=232) within 1 week of the AE (from	PARAMN=231 and one record from	and one record from PARAMN=232 with ADLB.ADT (from	by concatenating the corresponding ASPID from
÷ 1				of the AE (from PARAMN=231), then 'Hypoglycemia	PARAMN=231), then 23;	PARAMN=232 with ADLB.ADT (from	PARAMN=232) within 1 week of the AE (from	PARAMN=231 and 232, separated by comma (",");
1				Term + Plasma Glucose < 70 mg/dL': Create a	If a participant has more than 1 record from	PARAMN=232) within 1 week of the AE (from	PARAMN=231), then set to missing;	If a participant has both one record from
۰.				record;	PARAMN=231 and more than 1 record from	PARAMN=231), then minimum of ASTDT that	If a participant has both one record from PARAMN=231	PARAMN=231 and one record from PARAMN=232
8				If a participant has more than 1 record from	PARAMN=232, then 24.	linked to the event used to derive;	and one record from PARAMN=232 with ADLB.ADT (from	with ADLB.ADT (from PARAMN=232) within 1 week of
-				PARAMN=231 and more than 1 record from		If a participant has both one record from	PARAMN=232) within 1 week of the AE (from	the AE (from PARAMN=231), then ARELID is created
2				PARAMN=232, then '>= 2 Hypoglycemia Terms +		PARAMN=231 and one record from	PARAMN=231), then set to missing.	by concatenating the corresponding ASPID from
				>= 2 Episodes of Plasma Glucose < 70 mg/dL' :		PARAMN=232 with ADLB.ADT (from		PARAMN=231 and 233, separated by comma (",").
1				Create a record.		PARAMN=232) within 1 week of the AE (from		
*						PARAMN=231), then minimum of ASTDT that		



Proposal 2: Sample Dataset

/ \	U	\sim		L		0		1	,	18	L.	1.41	1 N
USUBJID	ASTDT	PARAM	PARAMCD	PARAMN	AVALC	AVAL	HYPSCAT	SRCVALUE	SRCVAR	SRCDOM	SRCSEQ	ASPID	ARELID
3002	5/2/2023	Hypoglycemia	HYPOG	2	Any Hypoglycemia FMQ Narrow Term	21		Hypoglycemia	FMQNAM	ADAEFMQ	39		
3002	5/21/2023	Hypoglycemia	HYPOG	2	Any Hypoglycemia FMQ Narrow Term	21		Hypoglycemia	FMQNAM	ADAEFMQ	48		
3002	5/3/2023	Hypoglycemia	HYPOG	2	Plasma Glucose < 54 mg/dL	22		32	AVAL	ADLB	100		
3002	5/2/2023	Hypoglycemia	HYPOG	2	Hypoglycemia Term	231		Hypoglycemia	FMQNAM	ADAEFMQ	40	231-1	
3002	5/5/2023	Hypoglycemia	HYPOG	2	Hypoglycemia Term	231		Fatigue	AEDECOD	ADAE	930	231-2	
3002	5/3/2023	Hypoglycemia	HYPOG	2	Plasma Glucose < 70 mg/dL	232		32	AVAL	ADLB	100	232-1	
3002	5/2/2023	Hypoglycemia	HYPOG	2	Hypoglycemia Term + Plasma Glucose < 70 mg/dL	23							231-1,232-1
3002		Hypoglycemia	НҮРОС	2	>=2 Hypoglycemia Terms +>=2 Episodes of Plasma Glucose < 70 mg/dL	24	This record wil	l not be populated	in dataset sinc	e no criteria me	et		







Proposal 2:

Each ALGFMQ criterion is set as an AVALC. AVALC is the target analysis variable.







Proposal 3: Specification

OCCDS Key variables:

- ATERM: ALGFMQ criterion
- ACAT1: ALGFMQ
- ASPID, ARELID, SRCVALUE, SRCVAR, SRCDOM, SRCSEQ: created for traceability

	U	~					
Variable Name	Variable Label	Туре	Derivation				
All core varia	bles should be carried over from AD	SL					
DIABETFL	History of Diabetes	Char	ADSL.DIABETFL				
			This variable is needed in FMQ (Hypersensitivity) related analysis table.				
ASTDT	Analysis Start Date	integer	See Value-level Metadata				
ASTDY	Analysis Start Relative Day	integer	ASTDT-TRTSDT + 1				
ACAT1	Analysis Category 1	Char	See Value-level Metadata				
ACAT1N	Analysis Category 1 (N)	integer	1=Rhabdomyolysis				
			2=Hypoglycemia				
			3=Hyperglycemia				
			4=Hypersensitivity				
ATERM	Analysis Term	Char	See Value-level Metadata				
ATERMN	Analysis Term (N)	integer	See Value-level Metadata				
HYPSCAT	Hypersensitivity Category	Char	Determine if Hypersensitivity belong to category A, B, C, or D per FDA				
			FMQ master file.				
SRCVALUE	Source Value	Char	The source value that used in derived ATERM				
SRCVAR	Source Variable	Char	The name of source variable used to derive ATERM				
SRCDOM	Source Data	Char	The name of source dataset that used to derive ATERM. If multiple				
			source datasets are used, set NULL.				
SRCSEQ	Source Sequence Number	integer	The sequence numberSEQ or ASEQ of the row (in the domain or				
			dataset identified by SRCDOM) that relates to the analysis variable				
			(ATERM).				
ASPID	Analysis Identifier	Char	See Value-level Metadata				
ARELID	Analysis Relatioship Identifier	Char	See Value-level Metadata				



Proposal 3: Value-level Metadata

ACAT1	ACAT1N	ATERM	ATERMN	ASTDT	ASPID	ARELID	Derivation
Hypoglycemia	2	Any Hypoglycemia FMQ Narrow Term	21	ADAEFMQ.ASTDT	Set to missing	Set to missing	If ADAEFMQ.FMQNAM="Hypoglycemia" and ADAEFMQ.FMQCLASS="Narrow", then set ATERMN = 21, ATERM='Any Hypoglycemia FMQ narrow term". Create a record
Hypoglycemia	2	Plasma Glucose < 54 mg/dL	22	ADLB.ADT	Set to missing	Set to missing	From ADLB dataset. When ADLB.LCSPEC='PLASMA' and ADLB.PARAMCD='GLUC' and ADLB.AVALU='mg/dL' and ADLB.AVAL < 54, then set ATERMN = 22, ATERM='Plasma Glucose < 54 mg/dL': Create a record
Hypoglycemia	2	Hypoglycemia Term	231	ADAEFMQ.ASTDT/ADAE. ASTDT	For each participant, assign a sequencial number (seq) starting from 1 to n (n is number of records of ATERMN=231). ASPID is created by concatenating ATERMN and seq by dash ('-').	Set to missing	If ((ADAEFMQ.FMQNAM="Hypoglycemia" and ADAEFMQ.FMQCLASS="Broad") or ADAE AEDECOD in Accident, Anxiety, Asthenia, Cold sweat, Coma, Confusional state, Fall, Fatgue, Hunger, Hyperhidrosis, Irritability, Loss of consciousness, Palpitations, Road traffic accident, Seizure, Tremor, Dysarthria, Balance disorder, Coordination abnormal, Headache, Vision blurred, and Visual impairment)), then set ATERMN=231, ATERM = "Hypoglycemia Term"
Hypoglycemia	2	Plasma Glucose < 70 mg/dL	232	ADLB.ADT	For each participant, assign a sequencial number (seq) starting from 1 to n (n is number of records of ATERMN=232). ASPID is created by concatenating ATERMN and seq by dash (-').	Set to missing	If ADLB.PARAMCD='GLUC' and ADLB.LBSPEC='PLASMA' and ADLB.AVALU='mg/dL' and ADLB AVAL <70, then set ATERMN=232, ATERM="Plasma Glucose < 70 mg/dL"
Hypoglycemia	2	Hypoglycemia Term + Plasma Glucose < 70 mg/dL	23	Minimum of ASTDT that linked to the event used to derive	Set to missing	ARELID is created by concatenating the corresponding ASPID from ATERMN=231 and 232, separated by comma (",");	If a participant has both one record from ATERMN=231 and one record from ATERMN=232 with ADLB.ADT (from ATERMN=232) within 1 week of the AE (from ATERMN=231), then set ATERMN = 23, ATERM=Hypoglycemia Term + Plasma Glucose < 70 mg/dL:: Create a record
Hypoglycemia	2	>= 2 Hypoglycemia Terms + >= 2 Episodes of Plasma Glucose < 70 mg/dL	24	Minimum of ASTDT that linked to the event used to derive	Set to missing	ARELID is created by concatenating the corresponding ASPID from ATERMN=231 and 233, separated by comma (",");	If a participant has more than 1 record from ATERMN=231 and more than 1 record from ATERMN=232, then set ATERMN = 24, ATERM= '>= 2 Hypoglycemia Terms + >= 2 Episodes of Plasma Glucose < 70 mg/dL': Create a record



Proposal 3: Sample Dataset

USUBJID	ASTDT	ACAT1	ACAT1N	ATERM	ATERMN	HYPSCAT	SRCVALUE	SRCVAR	SRCDOM	SRCSEQ	ASPID	ARELID
3002	5/2/2023	Hypoglycemia	2 /	Any Hypoglycemia FMQ Narrow Term	21		Hypoglycemia	FMQNAM	ADAEFMQ	39		
3002	5/21/2023	Hypoglycemia	2 /	Any Hypoglycemia FMQ Narrow Term	21		Hypoglycemia	FMQNAM	ADAEFMQ	48		
3002	5/3/2023	Hypoglycemia	2 1	Plasma Glucose < 54 mg/dL	22		32	AVAL	ADLB	100		
3002	5/2/2023	Hypoglycemia	2 1	Hypoglycemia Term	231		Hypoglycemia	FMQNAM	ADAEFMQ	40	231-1	
3002	5/5/2023	Hypoglycemia	2 1	Hypoglycemia Term	231		Fatigue	AEDECOD	ADAE	930	231-2	
3002	5/3/2023	Hypoglycemia	2 1	Plasma Glucose < 70 mg/dL	232		32	AVAL	ADLB	100	232-1	
3002	5/2/2023	Hypoglycemia	2 1	Hypoglycemia Term + Plasma Glucose < 70 mg/dL	23							231-1,232-1
3002		Hypoglycemia	2 >	>=2 Hypoglycemia Terms + >=2 Episodes of Plasma Glucose < 70 mg/dL	24	This record wi	ll not be populated	in dataset since n	o criteria met			









Proposal 3:

Each ALGFMQ criterion is set as an ATERM. ATERM is the target analysis variable.







Programming of Dataset

Designing characteristics:

- Use frame to read source datasets and create attribute generally.
- Create 4 independent sub-macro to update each ALGFMQ easily; Develop new sub-macro to add new ALGFMQ in future.

• Load sub-macro flexibly as needed.

<pre>data ads1; set lptds.ads1; run; data adaefmq; set lptds.adaefmq; run; *</pre>	*;
<pre>set lptds.adsl; run; data sdaefmq; set lptds.adsefmq; run; %</pre>	*;
<pre>run; data adaefmq; set lptda.adaefmq; run; %*</pre>	*;
<pre>data adaefmq; set lptda.adaefmq; run; %</pre>	*;
<pre>set lptda.adaefmq; run; %*</pre>	*;
<pre>run; *</pre>	*;
<pre>%*</pre>	*;
<pre>%*- Step 02: Create adecode for each FHQ-*; %* /*Rhabdomyolysis*/ %rhabdo(output_dataset = rhab_all);</pre>	
<pre>%*</pre>	*;
/*Rhabdomyolysis*/ %rhabdo(output_dataset = rhab_all);	
%rhabdo(output_dataset = rhab_all);	
/*Hypoglycemia*/	
<pre>% hypog(output_dataset = hypog_all);</pre>	
/*Hyperglycemia*/	
<pre>%*hyper(output_dataset = hyper_all);</pre>	
/*Hypersensitivity*/	
<pre>%hyps(input_dataset=adaefmq, dict_dataset=lptde.hyps2024, output_dataset=hyps_all, deb</pre>	ug=N);
data _adalgfmq;	
<pre>set rhab_all /*hypog_all hyper_all*/ hyps_all;</pre>	
run/	
prog sort data= adalging; by usublid acatin aterns astdt arcseg; run;	
the sets area "aperired; of approve account account account, sets	
	*2
• Step 05: ADALGFNQ Create final dataset	*;



Summary

*



Summary

Proposal	Description
1	Each ALGFMQ criterion is set as a PARAM. PARAM is the target analysis variable. Value-level metadata is clear. Traceability can be achieved. However, the dataset is not analysis-ready.
2	Each ALGFMQ criterion is set as an AVALC. AVALC is the target analysis variable. The dataset is analysis-ready. But Value-level metadata is hard to read. Compared to the others, traceability is complex.
3	Each ALGFMQ criterion is set as an ATERM. ATERM is the target analysis variable. The dataset is analysis-ready. Value-level metadata is clear. Traceability can be achieved too.

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