

Endocrinology: Hypoglycemia Order Set

Order Set: Conceptual Structure

Contract: VA118-16-D-1008, Task Order (TO): VA-118-16-F-1008-0007, CLIN0004AE

Department of Veterans Affairs (VA)



**Knowledge Based Systems (KBS)
Office of Informatics and Information Governance (OIIG)
Clinical Decision Support (CDS)**

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Endocrinology: Hypoglycemia Order Set: Order Set: Conceptual Structure

by Knowledge Based Systems (KBS), Office of Informatics and Information Governance (OIIG), and Clinical Decision Support (CDS)

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Preface

Table 1. Revision History

Date	Life Cycle Event
May 17, 2018	Published
May 17, 2018	Reviewed
April 20, 2018	Pre-published
April 20, 2018	Created

Table 2. Clinical White Paper Contributors

Name	Role	Affiliation
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Table 3. Artifact Identifier

Domain	Artifact ID	Name
urn:va.gov:kbs:knart:artifact:r1	b5c97034-fb05-5d16-9102-ca6b75b56d25	B33

Artifact Applicability

Table 4. Applicability Foci, Description and Codes

Focus	Description	Code System	Code	Value Set	Value Set Version
TargetUser	Clinical Providers			N/A	N/A
PatientAgeGroup	Adult outpatient with an active problem of either diabetes mellitus, type 1 or type 2	SNOMED CT	133936004 Adult (person)	N/A	N/A
ClinicalVenue	Emergency Department (ED)			N/A	N/A
ClinicalVenue	inpatient hospital			N/A	N/A
ClinicalVenue	urgent care			N/A	N/A
ClinicalVenue	ambulatory care clinic			N/A	N/A
WorkflowTask	Care and Management of the Diabetic Patient			N/A	N/A

Models

Table 5. Model References

Referenced Model	Description
urn:solor.io:anf-model:1.0	VA Analysis Normal Form Model

Chapter 1. External Data Definitions

Definitions

Table 1.1. insulin

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic Annotation: active medication of regular insulin or isophane insulin (NPH) Codes: elm:element[elm:Code]: [[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006 Administration - action (qualifier value)] ->(363701004 Direct substance (attribute))->[126210001 Human insulin product (product)]]elm:element[elm:Code]: [[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006 Administration - action (qualifier value)] ->(363701004 Direct substance (attribute))->[416089000 Isophane insulin human (product)]]
--

Table 1.2. sulfonylurea

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic Annotation: sulfonylurea medication Codes: elm:element[elm:Code]: [[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006 Administration - action (qualifier value)] ->(363701004 Direct substance (attribute))->[34012005 Product containing sulfonylurea (medicinal product)]]

Table 1.3. glucagon

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic Annotation: glucagon medication Codes: elm:element[elm:Code]: [[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006 Administration - action (qualifier value)] ->(363701004 Direct substance (attribute))->[10712001 Product containing glucagon (medicinal product)]]

Table 1.4. hypoglycemicEpisodeOrRisk

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic Annotation: evaluation of a hypoglycemic episode or hypoglycemia risk Codes: elm:element[elm:Code]: [[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006 Administration - action (qualifier value)] ->(363701004 Direct substance (attribute))->[10712001 Product containing glucagon (medicinal product)]]elm:element[elm:Code]: [[225338004 Risk assessment (procedure)] ->(363702006 Has focus (attribute))->[237630007 Hypoglycemic disorder (disorder)]]
--

Table 1.5. anyTypeOfInsulin

Expression: type=elm:Retrieve , dataType=anf:ClinicalStatement, codeProperty=topic Annotation: active medication of any type of insulin Codes: elm:element[elm:Code]: [[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006 Administration - action (qualifier value)] ->(363701004 Direct substance (attribute))->[39487003 Product containing insulin (medicinal product)]]

Triggers

No trigger definitions are present.

Chapter 2. Expression Definitions

No expression definitions are present.

Chapter 3. Medications

The Medications section should be available to clinical providers for any patients presenting for evaluation of a hypoglycemic episode or hypoglycemia risk

Condition:elm:Exists (insulin)

Insulin

☐ Discontinue regular insulin (now)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Postcoordinated Expression [304540007 |Recommendation to stop drug treatment (procedure)]- ->363702006 |Has focus (attribute))->[416118004 |Administration (procedure)]- ->(363701004 |Direct substance (attribute))->[39487003 |Product containing insulin (medicinal product)];

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

☐ Discontinue NPH insulin (now)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Postcoordinated Expression [304540007 |Recommendation to stop drug treatment (procedure)]- ->363702006 |Has focus (attribute))->[416118004 |Administration (procedure)]- ->(363701004 |Direct substance (attribute))->[412220005 |Isophane insulin nph (product)];

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

☐ Insulin aspart solution subcutaneous 3 refills (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Postcoordinated Expression [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[388452006 |Product containing insulin aspart (medicinal product)] ->(410675002 |Route of administration (attribute))->[34206005 |Subcutaneous route (qualifier value)]

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

☐ Insulin glargine solution subcutaneous 3 refills (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Postcoordinated Expression [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[126212009 |Product containing insulin glargine (medicinal product)] ->(410675002 |Route of administration (attribute))->[34206005 |Subcutaneous route (qualifier value)]

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

☐ Insulin detemir solution subcutaneous 3 refills (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Postcoordinated Expression [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[414518007 |Product containing insulin detemir (medicinal product)] ->(410675002 |Route of administration (attribute))->[34206005 |Subcutaneous route (qualifier value)]

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

Condition:elm:Exists (sulfonylurea)

Sulfonylureas

☐ Discontinue glyburide (now)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Postcoordinated Expression [304540007 |Recommendation to stop drug treatment (procedure)]- ->363702006 |Has focus (attribute))->[416118004 |Administration (procedure)]- ->(363701004 |Direct substance (attribute))->[Rx;4815 gly-BURIDE];

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

☐ Glipizide 5 mg tablet oral 3 refills (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Postcoordinated Expression [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))->[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))->[Rx;310490 glipiZIDE 5 MG Oral Tablet] ->(410675002 |Route of administration (attribute))->[260548002 |Oral (qualifier value)]

unstructured[0]: 3 refills

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

Condition:elm:Exists (glucagon)

Glucagon

☐ Glucagon 1 mg solution subcutaneous; Use as needed for clinically significant hypoglycemia when situationally appropriate (e.g., blood glucose less than or equal to 54 mg/dL or other threshold as specified in patient treatment plan, or as directed and required by circumstances); Dissolve glucagon in accompanying diluent before administering; repeat after 15 minutes if delayed response; Dispense 2 kits; 3 refills (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Postcoordinated Expression [416118004 |Administration (procedure)] ->(260686004 |Method (attribute))>[129445006 |Administration - action (qualifier value)] ->(363701004 |Direct substance (attribute))>[Rx;310497 glucagon (rDNA) 1 MG Injection] ->(410675002 |Route of administration (attribute))>[34206005 |Subcutaneous route (qualifier value)]

unstructured[0]: dispense 2 kits; 3 refills

unstructured[1]: Use as needed for clinically significant hypoglycemia when situationally appropriate (e.g., blood glucose less than or equal to 54 mg/dL or other threshold as specified in patient treatment plan, or as directed and required by circumstances); Dissolve glucagon in accompanying diluent before administering; repeat after 15 minutes if delayed response

purpose[0]: Postcoordinated Expression [277132007 |Therapeutic procedure (procedure)] ->(363702006 |Has focus (attribute))>[302866003 |Hypoglycemia (disorder)]

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

Chapter 4. Supplies

Condition:elm:Exists (hypoglycemicEpisodeOrRisk)

Glucose Monitoring Supplies

☐ Blood glucose monitoring device dispense 1 device

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Postcoordinated Expression [439894008 |Provision of device (procedure)] -(363699004 |Direct device (attribute))-[354068006 |Blood glucose monitoring equipment (physical object)]

unstructured[0]: 1 device

☐ Blood glucose monitoring test strips dispense 1 box; 3 refills

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Postcoordinated Expression [439894008 |Provision of device (procedure)] -(363699004 |Direct device (attribute))-[337388004 |Blood glucose testing strips (physical object)]

unstructured[0]: 1 box, 3 refills

☐ Blood glucose monitoring lancets dispense 1 box; 3 refills

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Postcoordinated Expression [439894008 |Provision of device (procedure)] -(363699004 |Direct device (attribute))-[5110c3ba-4e1d-4929-8c44-9f6c09ba6425 |Blood glucose monitoring lancet (physical object)]

unstructured[0]: 1 box, 3 refills

☐ Alcohol swabs dispense 1 box; 3 refills

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Postcoordinated Expression [439894008 |Provision of device (procedure)] -(363699004 |Direct device (attribute))-[356858000 |Isopropyl alcohol 70% injection swab (physical object)]

unstructured[0]: 1 box, 3 refills

☐ Blood glucose monitoring control solution dispense 1 bottle; 3 refills

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Postcoordinated Expression [439894008 |Provision of device (procedure)] ->(363699004 |Direct device (attribute))->[f60e8123-93bd-462b-94bf-41bcc4ed8685 |Blood glucose monitoring control solution (physical object)]

unstructured[0]: 1 bottle, 3 refills

Condition:elm:Exists (anyTypeOfInsulin)

Insulin Supplies

☐ Insulin syringes dispense 1 box; 3 refills

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Postcoordinated Expression [439894008 |Provision of device (procedure)] ->(363699004 |Direct device (attribute))->[462662009 |Insulin syringe, fixed-needle (physical object)]

Chapter 5. Laboratory Tests

Conditions

Condition: elm:Exists (hypoglycemicEpisodeOrRisk)
--

☐ Basic metabolic profile

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression 1421000205106 |Basic metabolic panel (procedure)|

☐ HbA1c

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression 43396009 |Hemoglobin A1c measurement (procedure)|

☐ Fasting blood glucose

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression 271062006 |Fasting blood glucose measurement (procedure)|

☐ Serum creatinine

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression 113075003 |Creatinine measurement, serum (procedure)|

☐ Urinary albumin-to-creatinine ratio

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression 271075006 |Urine albumin/creatinine ratio measurement (procedure)|

☐ Urinalysis

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression 27171005 |Urinalysis (procedure)|

☐ Complete blood count

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression 26604007 |Complete blood count (procedure)|

☐ Liver function tests

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression 26958001 |Hepatic function panel (procedure)|

☐ Fasting lipid profile

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|
topic: Precoordinated Expression 252150008 |Fasting lipid profile (procedure)|

Chapter 6. Point-of-Care Tests

Conditions
Condition: elm:Exists (hypoglycemicEpisodeOrRisk)

☐ Fingertstick blood glucose 1 time (now)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression 302789003 |Capillary blood glucose measurement (procedure)|

☐ Dipstick urine ketones 1 time (now)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression TSR

☐ Dipstick urine albumin 1 time (now)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression 271347000 |Urine dipstick for ketones (procedure)|

Chapter 7. Consults and Referrals

□ Consult care management to evaluate risks related to the patient's ability to adhere to the treatment plan. Factors evaluated should include access to and ability to use self-monitoring of blood glucose (SMBG) device, glucagon, and insulin injections as directed as well as other factors that may increase the patient's risk of hypoglycemia (e.g., food insufficiency). Actions to be taken may include connecting the patient to appropriate services to mitigate risks, ensuring availability and patient understanding of the patient-specific symptom action plan, and identification and management of any psychosocial barriers to care (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression 97ebe45b-29b3-4ef6-8e87-766934db5eb7 |Case management consultation and report (procedure)|

unstructured[0]: Factors evaluated should include access to and ability to use self-monitoring of blood glucose (SMBG) device, glucagon, and insulin injections as directed as well as other factors that may increase the patient's risk of hypoglycemia (e.g., food insufficiency). Actions to be taken may include connecting the patient to appropriate services to mitigate risks, ensuring availability and patient understanding of the patient-specific symptom action plan, and identification and management of any psychosocial barriers to care

purpose[0]: Postcoordinated Expression [225338004 |Risk assessment (procedure)] ->(363702006 |Has focus (attribute))->[397695000 |Finding related to ability to comply with treatment (finding)]

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

□ Consult nutrition service (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression c86bf351-ec7e-4310-ae35-5cfc41d3f9fe |Nutrition and food services consultation and report (procedure)|

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

□ Consult social services to evaluate psychosocial barriers to care (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression 935b3-168e-4e9a-96d2-4135409ce715 |Social services consultation and report (procedure)|

unstructured[0]: evaluate functional status issues that may interfere with diabetes self-management

purpose[0]: Precoordinated Expression [386053000 |Evaluation procedure (procedure)] ->(284465006 |Finding relating to psychosocial functioning (finding))

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

□ Consult occupational therapy to evaluate functional status issues that may interfere with diabetes self-management (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Postcoordinated Expression [11429006 |Consultation (procedure)] ->(363702006 |Has focus (attribute))->[84478008 |Occupational therapy (regime/therapy)]

unstructured[0]: evaluate functional status issues that may interfere with diabetes self-management

purpose[0]: Postcoordinated Expression [386053000 |Evaluation procedure (procedure)] ->(363702006 |Has focus (attribute))->[248536006 |Finding of functional performance and activity (finding)]

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

□ Consult physical therapy to evaluate functional status issues that may interfere with diabetes self-management (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression 71318009 |Physical medicine consultation and report (procedure)|

unstructured[0]: evaluate functional status issues that may interfere with diabetes self-management

purpose[0]: Postcoordinated Expression [386053000 |Evaluation procedure (procedure)] ->(363702006 |Has focus (attribute))->[248536006 |Finding of functional performance and activity (finding)]

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

□ Consult diabetes education to evaluate self-management issues such as knowledge and skill deficiencies (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Postcoordinated Expression [11429006 |Consultation (procedure)] ->(363702006 |Has focus (attribute))->[385805005 |Diabetic care education (procedure)]

unstructured[0]: evaluate self-management issues such as knowledge and skill deficiencies

purpose[0]: Postcoordinated Expression [386053000 |Evaluation procedure (procedure)] ->(363702006 |Has focus (attribute))->[733863009 |Assessment of readiness for self-management (procedure)]

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

□ Consult psychiatry to evaluate mental health issues that may interfere with diabetes self-management (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression [bc33b934-5dd3-4742-a09d-ef2d2187bb11 |Psychiatric consultation and report (procedure)]

unstructured[0]: evaluate mental health issues that may interfere with diabetes self-management

purpose[0]: Postcoordinated Expression [386053000 |Evaluation procedure (procedure)] ->(363702006 |Has focus (attribute))->[413307004 |Mental health problem (finding)]

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

□ Consult geriatric medicine to evaluate hypoglycemia risk (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression 901c349c-4a30-4b36-8d5c-a8c03da98f61 |Geriatric medicine consultation and report (procedure)|

purpose[0]: Postcoordinated Expression [225338004 |Risk assessment (procedure)] ->(363702006 |Has focus (attribute))->[302866003 |Hypoglycemia (disorder)]

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

☐ Consult clinical pharmacy to evaluate diabetic medication therapy (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression 484734b5-57e4-4a57-9800-0cee25db8573 |Clinical pharmacy consultation and report (procedure)|

purpose[0]: Precoordinated Expression 394725008 |Diabetes medication review (procedure)|

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

Chapter 8. Patient and Caregiver Education

Conditions
Condition: elm:Exists (hypoglycemicEpisodeOrRisk)

- ☐ Diabetes self-management education (routine)

actionSentence[type=elm:Instance, classType=anf:ClinicalStatement]

statementType: Precoordinated Expression 385644000 |Requested (qualifier value)|

topic: Precoordinated Expression 398773005 |Diabetes self-monitoring health education (procedure)|

priority: Precoordinated Expression 50811001 |Routine (qualifier value)|

- ☐ ☆ Provide patient with link for on-line education

Unresolved related resource reference (root='LocalDocBook', extension='e10')

Chapter 9. Tabular List

Terminology Service Request (TSR) Mappings

Table 9.1. Terminology Versions

Name	Identifier	Version
SNOMED CT	2.16.840.1.113883.6.96	United States Edition 20180301

Table 9.2. Terminology References

System	Code	Display Text ^a	References ^b
SNOMED CT	113075003 Creatinine measurement, serum (procedure)	Precoordinated Expression	1
SNOMED CT	133936004 Adult (person)	Adult outpatient with an active problem of either diabetes mellitus, type 1 or type 2	1
SNOMED CT	1421000205106 Basic metabolic panel (procedure)	Precoordinated Expression	1
SNOMED CT	252150008 Fasting lipid profile (procedure)	Precoordinated Expression	1
SNOMED CT	26604007 Complete blood count (procedure)	Precoordinated Expression	1
SNOMED CT	26958001 Hepatic function panel (procedure)	Precoordinated Expression	1
SNOMED CT	271062006 Fasting blood glucose measurement (procedure)	Precoordinated Expression	1
SNOMED CT	271075006 Urine albumin/creatinine ratio measurement (procedure)	Precoordinated Expression	1
SNOMED CT	271347000 Urine dipstick for ketones (procedure)	Precoordinated Expression	1
SNOMED CT	27171005 Urinalysis (procedure)	Precoordinated Expression	1
SNOMED CT	302789003 Capillary blood glucose measurement (procedure)	Precoordinated Expression	1
SNOMED CT	385644000 Requested (qualifier value)	Precoordinated Expression	36
SNOMED CT	394725008 Diabetes medication review (procedure)	Precoordinated Expression	1
SNOMED CT	398773005 Diabetes self-monitoring health education (procedure)	Precoordinated Expression	1

System	Code	Display Text ^a	References ^b
SNOMED CT	43396009 Hemoglobin A1c measurement (procedure)	Precoordinated Expression	1
SNOMED CT	484734b5-57e4-4a57-9800-0b8573 Clinical pharmacy consultation and report (procedure)	Precoordinated Expression	1
SNOMED CT	50811001 Routine (qualifier value)	Precoordinated Expression	18
SNOMED CT	71318009 Physical medicine consultation and report (procedure)	Precoordinated Expression	1
SNOMED CT	901c349c-4a30-4b36-8d5c-a8c03da98f61 Geriatric medicine consultation and report (procedure)	Precoordinated Expression	1
SNOMED CT	935b3-168e-4e9a-96d2-413540c0715 Social services consultation and report (procedure)	Precoordinated Expression	1
SNOMED CT	97ebe45b-29b3-4e-f6-8e87-766934db5eb7 Case management consultation and report (procedure)	Precoordinated Expression	1
SNOMED CT	TSR	Precoordinated Expression	1
SNOMED CT	[11429006 Consultation (procedure)] ->(363702006 Has focus (attribute))->[385805005 Diabetic care education (procedure)]	Postcoordinated Expression	1
SNOMED CT	[11429006 Consultation (procedure)] ->(363702006 Has focus (attribute))->[84478008 Occupational therapy (regime/therapy)]	Postcoordinated Expression	1
SNOMED CT	[225338004 Risk assessment (procedure)] ->(363702006 Has focus (attribute))->[237630007 Hypoglycemic disorder (disorder)]	Postcoordinated Expression	1
SNOMED CT	[225338004 Risk assessment (procedure)] ->(363702006 Has focus (attribute))->[302866003 Hypoglycemia (disorder)]	Postcoordinated Expression	1

System	Code	Display Text ^a	References ^b
SNOMED CT	[225338004 Risk assessment (procedure)] ->(363702006 Has focus (attribute))->[397695000 Finding related to ability to comply with treatment (finding)]	Postcoordinated Expression	1
SNOMED CT	[277132007 Therapeutic procedure (procedure)] ->(363702006 Has focus (attribute))->[302866003 Hypoglycemia (disorder)]	Postcoordinated Expression	1
SNOMED CT	[304540007 Recommendation to stop drug treatment (procedure)]- ->363702006 Has focus (attribute))->[416118004 Administration (procedure)]- ->(363701004 Direct substance (attribute))->[39487003 Product containing insulin (medicinal product)];	Postcoordinated Expression	1
SNOMED CT	[304540007 Recommendation to stop drug treatment (procedure)]- ->363702006 Has focus (attribute))->[416118004 Administration (procedure)]- ->(363701004 Direct substance (attribute))->[412220005 Isophane insulin nph (product)];	Postcoordinated Expression	1
SNOMED CT	[304540007 Recommendation to stop drug treatment (procedure)]- ->363702006 Has focus (attribute))->[416118004 Administration (procedure)]- ->(363701004 Direct substance (attribute))->[Rx;4815 gly-BURIDE];	Postcoordinated Expression	1
SNOMED CT	[386053000 Evaluation procedure (procedure)] ->(284465006 Finding relating to psychosocial functioning (finding))	Precoordinated Expression	1

System	Code	Display Text ^a	References ^b
SNOMED CT	[386053000 Evaluation procedure (procedure)] ->(363702006 Has focus (attribute))->[248536006 Finding of functional performance and activity (finding)]	Postcoordinated Expression	2
SNOMED CT	[386053000 Evaluation procedure (procedure)] ->(363702006 Has focus (attribute))->[413307004 Mental health problem (finding)]	Postcoordinated Expression	1
SNOMED CT	[386053000 Evaluation procedure (procedure)] ->(363702006 Has focus (attribute))->[733863009 Assessment of readiness for self-management (procedure)]	Postcoordinated Expression	1
SNOMED CT	[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006 Administration - action (qualifier value)] ->(363701004 Direct substance (attribute))->[10712001 Product containing glucagon (medicinal product)]	Postcoordinated Expression	2
SNOMED CT	[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006 Administration - action (qualifier value)] ->(363701004 Direct substance (attribute))->[126210001 Human insulin product (product)]	Postcoordinated Expression	1
SNOMED CT	[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006 Administration - action (qualifier value)] ->(363701004	Postcoordinated Expression	1

System	Code	Display Text ^a	References ^b
	Direct substance (attribute))->[126212009 Product containing insulin glargine (medicinal product)] ->(410675002 Route of administration (attribute))->[34206005 Subcutaneous route (qualifier value)]		
SNOMED CT	[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006 Administration - action (qualifier value)] ->(363701004 Direct substance (attribute))->[34012005 Product containing sulfonyleurea (medicinal product)]	Postcoordinated Expression	1
SNOMED CT	[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006 Administration - action (qualifier value)] ->(363701004 Direct substance (attribute))->[388452006 Product containing insulin aspart (medicinal product)] ->(410675002 Route of administration (attribute))->[34206005 Subcutaneous route (qualifier value)]	Postcoordinated Expression	1
SNOMED CT	[416118004 Administration (procedure)] ->(260686004 Method (attribute))->[129445006 Administration - action (qualifier value)] ->(363701004 Direct substance (attribute))->[39487003 Product containing insulin (medicinal product)]	Postcoordinated Expression	1
SNOMED CT	[416118004 Administration (procedure)] ->(260686004 Method (at-	Postcoordinated Expression	1

System	Code	Display Text ^a	References ^b
	tribute))->[129445006 Administration - ac- tion (qualifier val- ue)] ->(363701004 Direct substance (at- tribute))->[414518007 Product containing in- sulin detemir (medicinal product)] ->(410675002 Route of administration (attribute))->[34206005 Subcutaneous route (quali- fier value)]		
SNOMED CT	[416118004 Adminis- tration (procedure)] - >(260686004 Method (at- tribute))->[129445006 Administration - ac- tion (qualifier val- ue)] ->(363701004 Direct substance (at- tribute))->[416089000 Isophane insulin human (product)]	Postcoordinated Expression	1
SNOMED CT	[416118004 Adminis- tration (procedure)] - >(260686004 Method (at- tribute))->[129445006 Administration - ac- tion (qualifier val- ue)] ->(363701004 Direct substance (at- tribute))->[Rx;310490 glipiZIDE 5 MG Oral Tablet] ->(410675002 Route of administration (attribute))->[260548002 Oral (qualifier value)]	Postcoordinated Expression	1
SNOMED CT	[416118004 Adminis- tration (procedure)] - >(260686004 Method (at- tribute))->[129445006 Administration - ac- tion (qualifier val- ue)] ->(363701004 Direct substance (at- tribute))->[Rx;310497 glucagon (rDNA) 1 MG Injection] ->(410675002 Route of administration (attribute))->[34206005	Postcoordinated Expression	1

System	Code	Display Text ^a	References ^b
	Subcutaneous route (qualifier value)]		
SNOMED CT	[439894008 Provision of device (procedure)] -(363699004 Direct device (attribute))-[337388004 Blood glucose testing strips (physical object)]	Postcoordinated Expression	1
SNOMED CT	[439894008 Provision of device (procedure)] -(363699004 Direct device (attribute))-[354068006 Blood glucose monitoring equipment (physical object)]	Postcoordinated Expression	1
SNOMED CT	[439894008 Provision of device (procedure)] -(363699004 Direct device (attribute))-[356858000 Isopropyl alcohol 70% injection swab (physical object)]	Postcoordinated Expression	1
SNOMED CT	[439894008 Provision of device (procedure)] -(363699004 Direct device (attribute))-[462662009 Insulin syringe, fixed-needle (physical object)]	Postcoordinated Expression	1
SNOMED CT	[439894008 Provision of device (procedure)] -(363699004 Direct device (attribute))-[5110c3ba-4e1d-4929-8c44-9f6c09ba6425 Blood glucose monitoring lancet (physical object)]	Postcoordinated Expression	1
SNOMED CT	[439894008 Provision of device (procedure)] -(363699004 Direct device (attribute))-[f60e8123-93bd-462b-94bf-41bc-c4ed8685 Blood glucose monitoring control solution (physical object)]	Postcoordinated Expression	1

System	Code	Display Text ^a	References ^b
SNOMED CT	[bc33b934-5d-d3-4742-a09d-ef2d2187b-b11 Psychiatric consultation and report (procedure)	Precoordinated Expression	1
SNOMED CT	c86bf351-ec7e-4310-ae35-5cfc41d3f9fe Nutrition and food services consultation and report (procedure)	Precoordinated Expression	1

^aIf a code is used multiple times in the KNART, only the display text of the first instance is shown.

^bCount of the number of times the given code system and code pair is used in the KNART.

Chapter 10. Behavior Symbols

Table 10.1. Group Organizational Behavior

Sym- bol	Name	Definition
▶	Sentence Group	A group of related alternative actions is a sentence group if the item referenced by the action is the same in all the actions, and each action simply constitutes a different variation on how to specify the details for that item. For example, two actions that could be in a SentenceGroup are "aspirin, 500 mg, 2 times per day" and "aspirin, 300 mg, 3 times per day". In both cases, aspirin is the item referenced by the action, and the two actions represent two different options for how aspirin might be ordered for the patient. Note that a SentenceGroup would almost always have an associated selection behavior of "AtMostOne", unless it's a required action, in which case, it would be "ExactlyOne".
▷	Logical Group	A group with this behavior logically groups its sub-elements, and may be shown as a visual group to the end user, but it is not required to do so.
➤	Visual Group	Any group marked with this behavior should be displayed as a visual group to the end user.

Table 10.2. Group Selection Behavior

Sym- bol	Name	Definition
□	Any	Any number of the items in the group may be chosen, from zero to all.
⦿	All	All the items in the group must be selected as a single unit.
⊙	AllOrNone	All the items in the group are meant to be chosen as a single unit: either all must be selected by the end user, or none may be selected.
○	ExactlyOne	The end user must choose one and only one of the selectable items in the group. The user may not choose none of the items in the group.
⊛	AtMostOne	The end user may choose zero or at most one of the items in the group.
⦿	OneOrMore	The end user must choose a minimum of one, and as many additional as desired.

Table 10.3. Required Behavior

Sym- bol	Name	Definition
◆	Must	An action with this behavior must be included in the actions processed by the end user; the end user may not choose not to include this action.

Sym- bol	Name	Definition
◇	Could	An action with this behavior may be included in the set of actions processed by the end user.
➤	MustUnlessDocumented	An action with this behavior must be included in the set of actions processed by the end user, unless the end user provides documentation as to why the action was not included.

Table 10.4. Precheck Behavior

Sym- bol	Name	Definition
▲	Yes	An action with this behavior is one of the most frequent actions that is, or should be, included by an end user, for the particular context in which the action occurs. The system displaying the action to the end user should consider "pre-checking" such an action as a convenience for the user.
▽	No	An action with this behavior is one of the less frequent actions included by the end user, for the particular context in which the action occurs. The system displaying the actions to the end user would typically not "pre-check" such an action.

Table 10.5. Cardinality Behavior

Sym- bol	Name	Definition
◆	Single	An action with this behavior may only be completed once.
❖	Multiple	An action with this behavior may be repeated multiple times.

Table 10.6. Item Flags

Sym- bol	Name	Definition
☞	fillIn	This item, in a list entry, allows the user to enter a fill in value that is not present in the set of presented choices.

Table 10.7. Read Only Behavior

Sym- bol	Name	Definition
☆	true	For a particular action or action group, specifies whether the elements are read only.

Appendix A. References

This appendix contains the list of related resources and supporting documents used in creating this KNART.

List of References

Related Resources

[CCWP] *Endocrinology: Hypoglycemia Clinical Content White Paper*

[CSD] *Endocrinology: Hypoglycemia Order Set Conceptual Structure Document*

[KVRpt] *Endocrinology: Hypoglycemia Order Set KNART Validation Report*

Supporting Evidence

[ADA, 2017] *American Diabetes Association. Diabetes Care. Standards of medical care in diabetes-2017* 2017;40(suppl 1):S1-S135 (link [http://care.diabetesjournals.org/content/diacare/suppl/2016/12/15/40.Supplement_1.D-C1/DC_40_S1_final.pdf])

[O'Neil 2015] *O'Neil G. V1-High Risk for Hypoglycemia. June 4, 2015 VISN 1 hypoglycemia reminder PowerPoint (Linda Wedemeyer, MD, email communication, July 10, 2017)* (link [[V1_HIGH RISK FOR HYPOGLYCEMIA.PowerPoint.ppt](#)].)

[Sequist 2013] *Sequist ER, Anderson J, Childs B, et al. Hypoglycemia and diabetes: a report of a workgroup of the American Diabetes Association and the Endocrine Society. Diabetes Care. 2013;36(5):1384-1395* (link [<https://doi.org/10.2337/dc12-2480>])

[NLM 2015a] *U.S. National Library of Medicine. GLIPIZIDE- glipizide tablet (Actavis Pharma, Inc.). DailyMed Website. Revised June 2015* (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=ad55dfd7-ffb5-478a-aa84-1009fa921e22>])

[NLM 2017a] *U.S. National Library of Medicine. GLUCAGON- glucagon [Eli Lilly and Company]. DailyMed Website. Revised May 2017* (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=f143db10-e889-41c3-84ed-603a0ab02f61>])

[NLM 2015b] *U.S. National Library of Medicine. LANTUS- insulin glargine injection, solution, LANTUS SOLOSTAR- insulin glargine injection, solution [sanofi-aventis U.S. LLC]. DailyMed Website Revised August 2015* (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=d5e07a0c-7e14-4756-9152-9fea485d654a>])

[NLM 2015c] *U.S. National Library of Medicine. LEVEMIR- insulin detemir injection, solution [Novo Nordisk]. DailyMed Website Revised February 2015* (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=d38d65c1-25bf-401d-9c7e-a2c3222da8af>])

[NLM 2017b] *U.S. National Library of Medicine. NOVOLOG- insulin aspart injection, solution [Novo Nordisk]. DailyMed Website. Revised March 2017* (link [<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=3a1e73a2-3009-40d0-876c-b4cb2be56fc5>])

[VA 5.0-2017] *U.S. Department of Veterans Affairs and U.S. Department of Defense. VA/DoD Clinical Practice Guideline for the Management of Type 2 Diabetes Mellitus in Primary Care, version 5.0—2017. VA/DoD Clinical Practice Guidelines website* (link [<https://www.healthquality.va.gov/guidelines/CD/diabetes/VADoD-DMCPGFinal508.pdf>])