Cardiology: Pre-Op Documentation Template

Documentation Template: Conceptual Structure

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Department of Veterans Affairs (VA)

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

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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
April 16, 2018	Published
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Table 2. Clinical White Paper Contributors

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Table 3. Artifact Identifier

Domain	Artifact ID	Name
urn:va.gov:kbs:knart:artifact:r1	323d2f5b-b412-59f3-8f44-2703a9ad420e	B13

Artifact Applicability

Table 4. Applicability Foci, Description and Codes

Focus	Description	Code System Name	Code System	Code	Code System Version	Value Set	Value Set Version
ClinicalFocus	Adult being considered for elective, non-emergent, non-cardiac surgery	SNOMED CT	SNOMED CT	274075007 |Optional surgery (procedure)|			

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

No external data definitions or triggers are present.

Chapter 2. Expression Definitions

No expression definitions are present.

Chapter 3. Order Set Applicability

This order set is not applicable to emergency surgery patients or patients with an acute coronary syndrome. It is intended for patients anticipating an elective, non-cardiac surgery. This order set should be used for a patient who is being referred to cardiology for preoperative cardiac risk stratification prior to non-cardiac surgery, subsequent to determination during use of the documentation template that the patient requires this evaluation. The referring provider should also consider ordering an appropriate risk stratification study from the options presented within this order set in conjunction with the cardiology consult. All orders are routine unless otherwise specified.

□ prompt: Acknowledge

response: Boolean (Single)

Chapter 4. Consults and Referrals

Order referral to cardiology for preoperative assessment prior to elective non-cardiac surgery
□ Order referral to cardiology for preoperative assessment prior to elective non-cardiac surgery actionSentence[type=elm:Instance, classType=anf:ClinicalStatement] "statementType:Precoordinated Expression topic:Precoordinated Expression , purpose[0]:Postcoordinated Expression" (Codes: 385644000 |Requested (qualifier value)| 183519002 | Referral to cardiology service (procedure)| [110466009 |Pre-surgery evaluation (procedure)] ->(363702006 |Has focus (attribute))->[adadbaee-7080-4bb2-83a2-977adb5b826e |Optional non-cardiac surgery (procedure)])

Chapter 5. Risk Stratification Testing

Exercise Stress testing

Consider for patients with no known or suspected coronary artery disease, low probability for coronary artery disease, ability to exercise, normal electrocardiogram, and heart rate > 60 beats per minute.

□ Exercise Stress Testing

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

"statementType:Precoordinated Expression topic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 447346005 | Cardiopulmonary exercise test (procedure)|)

Stress Testing with Echocardiography

Consider for patients with no known or suspected coronary artery disease, low to intermediate probability for coronary artery disease, ability to exercise, and normal electrocardiogram.

□ Stress Testing with Echocardiography

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

"statementType:Precoordinated Expression topic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 433233004 | Exercise stress echocardiography (procedure)|)

Dobutamine Stress Testing with Myocardial Perfusion Imaging (MPI)

Consider for patients with no known or suspected coronary artery disease, intermediate probability for coronary artery disease, inability to exercise, inability to tolerate other vasodilator stress agents and normal electrocardiogram.

□ Dobutamine stress testing with Myocardial Perfusion Imaging (MPI)

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| [16545191000119100 |Radionuclide myocardial perfusion stress study (procedure)] ->(424361007 |Using substance (attribute))->[387145002 |Dobutamine (substance)])

Coronary CT Angiogram

Consider for patients with no known or suspected coronary artery disease, high probability for coronary artery disease, inability to exercise, and normal electrocardiogram.

□ Coronary CT Angiogram

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

"statementType:Precoordinated Expression topic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 419545005 | Computed tomography angiography of coronary arteries (procedure)|)

Vasodilator Stress Testing with MPI

Consider for patients with no known or suspected coronary artery disease, intermediate probability for coronary artery disease, inability to exercise, and abnormal electrocardiogram.

□ Vasodilator Stress Testing with MPI

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| [16545191000119100 |Radionuclide myocardial perfusion stress study (procedure)] ->(424361007 |Using substance (attribute))->[372787008 |Vasodilator (substance)])

Vasodilator Stress Testing with MPI

Consider for patients with no known or suspected coronary artery disease, intermediate probability for coronary artery disease, inability to exercise, and abnormal electrocardiogram.

□ Adenosine Stress Testing Myocardial Perfusion Imaging

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| [16545191000119100 |Radionuclide myocardial perfusion stress study (procedure)] ->(424361007 |Using substance (attribute))->[35431001 |Adenosine (substance)])

Exercise Stress Testing with MPI

Consider for patients with known or suspected coronary artery disease, ability to exercise, and normal ST-T.

□ Exercise Stress Testing Myocardial Perfusion Imaging

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

"statementType:Precoordinated Expression topic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 703338002 |Stress echocardiography using dobutamine (procedure)|)

Dobutamine Stress Testing with Echocardiography or MPI

Consider for patients with known or suspected coronary artery disease, inability to exercise, normal electrocardiogram, and no prior myocardial infarction. Only one should be selected.

□ Dobutamine Stress Testing Echocardiography

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

"statementType:Precoordinated Expression topic:Precoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| 703338002 |Stress echocardiography using dobutamine (procedure)|)

□ Dobutamine Stress Testing Myocardial Perfusion Imaging

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| [16545191000119100 |Radionuclide myocardial perfusion stress study (procedure)] ->(424361007 |Using substance (attribute))->[387145002 |Dobutamine (substance)])

Vasodilator Stress Testing with MPI

Consider for patients with known or suspected coronary artery disease who have any of the following: abnormal electrocardiogram; permanent pacemaker with ventricular-paced rhythm; poor exercise tolerance. Also consider for patients with a history of myocardial infarction (MI) or regional wall motion abnormalities, especially for more severe/extensive disease.

□ Adenosine Stress Testing Myocardial Perfusion Imaging

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

"statementType:Precoordinated Expression topic:Postcoordinated Expression"

(Codes: 385644000 |Requested (qualifier value)| [16545191000119100 |Radionuclide myocardial perfusion stress study (procedure)] ->(424361007 |Using substance (attribute))->[35431001 |Adenosine (substance)])

Chapter 6. Tabular List

Terminology Service Request (TSR) Mappings

Table 6.1. Terminology Versions

Name	Identifer	Version
SNOMED CT	2.16.840.1.113883.6.96	United States Edition 20180301
RXNorm	2.16.840.1.113883.6.1	5-Mar-18

Table 6.2. Terminology References

System	Code	Display Text	References
SNOMED CT	183519002 |Referral to cardiology service (procedure)|	Precoordinated Expression	1
SNOMED CT	274075007 |Optional surgery (procedure)|	Adult being considered for elective, non-emergent, non-cardiac surgery	1
SNOMED CT	385644000 |Requested (qualifier value)|	Precoordinated Expression	11
SNOMED CT	419545005 |Computed tomography angiography of coronary arteries (procedure)|	Precoordinated Expression	1
SNOMED CT	433233004 |Exercise stress echocardiography (procedure)|	Precoordinated Expression	1
SNOMED CT	447346005 |Cardiopulmonary exercise test (procedure)|	Precoordinated Expression	1
SNOMED CT	703338002 |Stress echocardiography using dobutamine (procedure)|	Precoordinated Expression	2
SNOMED CT	[110466009 |Pre-surgery evaluation (procedure)] ->(363702006 |Has focus (attribute))->[adadbaee-7080-4bb2-83a2-977adb5b826e |Optional non-cardiac surgery (procedure)]	Postcoordinated Expression	1
SNOMED CT	[16545191000119100 |Radionuclide myocardial perfusion stress study (procedure)] ->(424361007 |Using substance (attribute))->[35431001 | Adenosine (substance)]	Postcoordinated Expression	2

System	Code	Display Text	References
SNOMED CT	[16545191000119100 |Radionuclide myocardial perfusion stress study (procedure)] ->(424361007 |Using substance (attribute))->[372787008 |Vasodilator (substance)]	Postcoordinated Expression	1
SNOMED CT	[16545191000119100 |Radionuclide myocardial perfusion stress study (procedure)] ->(424361007 |Using substance (attribute))->[387145002 | Dobutamine (substance)]	Postcoordinated Expression	2

Chapter 7. Behavior Symbols

Table 7.1. Group Organizational Behavior

Symbol	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 7.2. Group Selection Behavior

Symbol	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 7.3. Required Behavior

Symbol	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.

Symbol	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 7.4. Precheck Behavior

Symbol	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 7.5. Cardinality Behavior

Symbol	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 7.6. Item Flags

Symbol	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 7.7. Read Only Behavior

Symbol	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] *Cardiology: Pre-Op Risk Assessment Clinical Content White Paper*

[CSD] *Cardiology: Pre-Op Documentation Template Conceptual Structure Document*

[KVRpt] *Cardiology: Pre-Op Documentation Template KNART Validation Report*

[ACS, 2017] *ACS NSQIP Surgical Risk Calculator 2017* (link [http://riskcalculator.facs.org/RiskCalculator/index.jsp])

Supporting Evidence

[Daley, 2015] *Daley B.J., Cecil W, Clarke PC, Cofer JB, Guillamondegui OD. How slow is too slow? Correlation of operative time to complications: an analysis from the Tennessee Surgical Quality Collaborative. J Am Coll Surg. 2015;220(4):550-558* (link [https://doi.org/10.1016/j.jamcollsurg.2014.12.040])

[Donati 2004] *Donati A., Adrario M. A new and feasible model for predicting operative risk. Br J Anaesth. 2004;93(3):393-399* (link [https://doi.org/10.1093/bja/aeh210])

[Fleisher, 2014] *Fleisher LA, Fleischmann KE, Auerbach AD. 2014 ACC/AHA guideline on perioperative cardiovascular evaluation and management of patients undergoing non-cardiac surgery: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Circulation. 2014;130(24):e278-e333* (link [https://doi.org/10.1007/s12350-014-0025-z])

[Hlatky , 1989] *Hlatky MA, Boineau RE, Higginbotham MB. A brief self-administered questionnaire to determine functional capacity (the Duke Activity Status Index). Am J Cardiol. 1989;64(10):651-654* (link [http://www.ajconline.org/article/0002-9149(89)90496-7/pdf])

[Hu, 2016] *Hu WH, Chen HH, Lee KC. Assessment of the addition of hypoalbuminemia to ACS-NSQIP surgical risk calculator in colorectal cancer. Medicine (Baltimore). 2016;95(10):e2999* (link [https://doi.org/10.1097/MD.0000000000002999])

[Lee , 1999] *Lee TH, Marcantonio ER, Mangione CM. Derivation and prospective validation of a simple index for prediction of cardiac risk of major non-cardiac surgery. Circulation. 1999;100(10):1043-1049* (link [http://circ.ahajournals.org/content/100/10/1043.long])

[McMillan, 2017] *McMillan MT, Allegrini V, Asbun HJ. Incorporation of procedure-specific risk into the ACS-NSQIP surgical risk calculator improves the prediction of morbidity and mortality after pancreatoduodenectomy. Ann Surg. 2017;265(5):978-986* (link [https://doi.org/10.1097/SLA.0000000000001796])

[Neuberger, 2017] *Neuberger JM, Bechstein WO, Kuypers DR. Practical recommendations for long-term management of modifiable risks in kidney and liver transplant recipients: a guidance report and clinical checklist by the Consensus on Managing Modifiable Risk in Transplantation (COMMIT) Group. Transplantation. 2017;101(4S Suppl 2):S1-S56* (link [https://doi.org/10.1097/TP.0000000000001651])