Clinical & Financial Programs

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Screening for Frailty in Pre-Op Patients with the Risk Analysis Index

Last Updated: June 4, 2021

Epic

Table of Contents

Screening for Frailty in Pre-Op Patients with the Risk Analysis Index

Core Epic Tools	Flowsheets, BestPractice Advisories, SmartSets, Referral Orders, Rules
Timeline	One to two months
Versions	Epic 2018 and later
First Available	6/4/2021
Countries	United States

Executive Overview

UPMC LIFE CHANGING MEDICINE

0.87% decrease in mortality per month

Frailty refers to a patient's reduced physical, physiologic, and cognitive reserves which leave them vulnerable to adverse health outcomes after a stressful event such as a surgical procedure (1) (2). To help clinicians understand how patient frailty might affect recovery, clinicians can use the Risk Analysis Index (RAI), a 14-item clinical questionnaire that calculates a score that measures a patient's frailty. (3) (4) (5) (6) Clinicians can then consider the score when discussing surgical options with patients and use it to influence decisions about whether or when to perform surgery. Initial studies at the Omaha VA Medical Center suggest that frailty screening is associated with a nearly three-fold increase in in survival among the frail, and mortality from all causes fell from 25% to less than 8% after implementing frailty screening and a program of preoperative palliative care consultation. (7)

To help clinicians make use of this tool, the University of Pittsburgh Medical Center (UPMC) implemented a workflow where outpatient clinicians collect RAI data from patients directly in flowsheets at a pre-op appointment. Then, a BestPractice Advisory appears to the surgeon reminding them to review the score and suggesting potential follow-up actions based on the score's severity. At UPMC, the program only added an average of 30 seconds to clinic workflows while avoiding any clinical care disruptions. (8)

Based on a study of data at UPMC from January 2013 to January 2019, UPMC saw an overall average 0.87% monthly decrease in the one-year mortality rate following elective surgeries after implementing this program (9). Your organization can implement a similar program using flowsheets and BestPractice Advisories (BPAs). This document describes the build and implementation strategy for creating similar tools and a supporting workflow in your system.

Impact

Implementation:

Moderate

UPMC found that implementing this program took them a total of about 60 hours over less than two months. However, the tools used in this program, such as BPAs and SmartSets, are likely to be in use already at your organization. UPMC found that their time expenditure was involved in planning and building the RAI formula, so you can shorten your implementation time by using their formula out of the box.

Operational:

Moderate

The amount of time you'll need to implement this project varies depending on whether you already use the RAI in workflows, because clinicians might need additional time to become familiar with the RAI and learn to incorporate it into shared decision-making conversations with patients. Training for the program generally can be completed in a week or two.

You can track your implementation of this Program in Nova and mark your organization as live when it's complete. Use release note 746842-Screening for Frailty in Pre-Op Patients with the Risk Analysis Index. For more information about tracking Programs, refer to the Track Programs in Nova topic.

(1) Hoogendijk, E.O., et al., Frailty: Implications for Clinical Practice and Public Health. Lancet, 2019. 394(10206): p. 1365-1375.

(2) Clegg, A., et al., Frailty in elderly people. Lancet, 2013. 381(9868): p. 752-762.

(3) Hall DE, Arya S, Schmid KK, et al. Development and Initial Validation of the Risk Analysis Index for Measuring Frailty in Surgical Populations. JAMA Surg. Feb 1 2017;152(2):175-182. doi:10.1001/jamasurg.2016.4202

(4) Arya S, Varley P, Youk A, et al. Recalibration and External Validation of the Risk Analysis Index: A Surgical Frailty Assessment Tool. Ann Surg. Dec 2020;272(6):996-1005. doi:10.1097/SLA.0000000000003276

(5) Shinall MC, Jr., Youk A, Massarweh NN, et al. Association of Preoperative Frailty and Operative Stress With Mortality After Elective vs Emergency Surgery. JAMA Netw Open. Jul 1 2020;3(7):e2010358. doi:10.1001/jamanetworkopen.2020.10358

(6) Shah R, Borrebach JD, Hodges JC, et al. Validation of the Risk Analysis Index for Evaluating Frailty in Ambulatory Patients. J Am Geriatr Soc. Aug 2020;68(8):1818-1824. doi:10.1111/jgs.16453

(7) Hall DE, Arya S, Schmid KK, et al. Association of a Frailty Screening Initiative With Postoperative Survival at 30, 180, and 365 Days. *JAMA Surg*. Mar 1 2017;152(3):233-240. doi:10.1001/jamasurg.2016.4219

(8) Varley PR, Borrebach JD, Arya S, et al. Clinical Utility of the Risk Analysis Index as a Prospective Frailty Screening Tool within a Multi-practice, Multi-hospital Integrated Healthcare System. Ann Surg. Feb 28 2020;doi:10.1097/SLA.0000000000003808

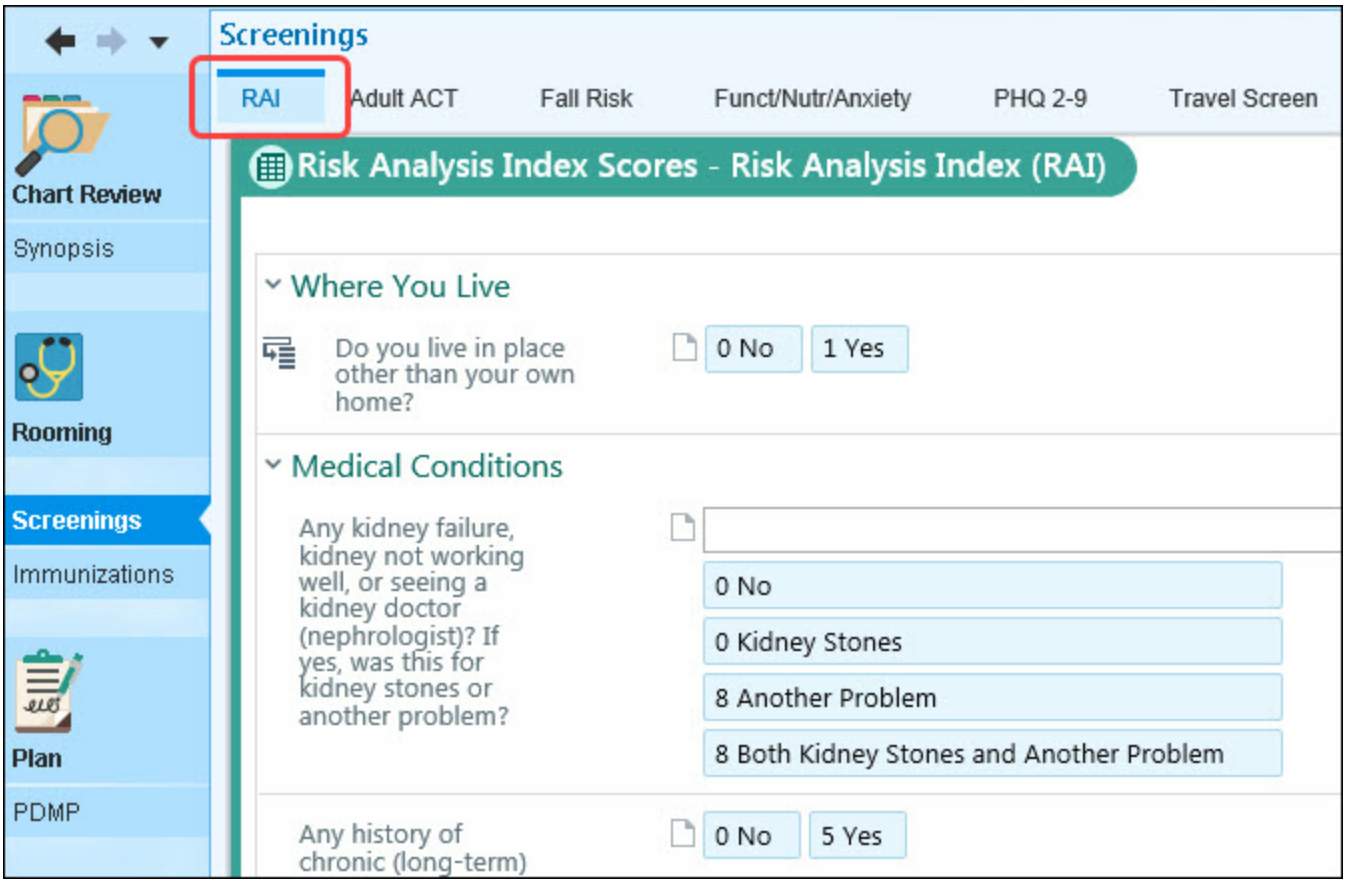
(9) Varley PR, O'Halloran P, Su H-D, et al. System-Wide, Prospective Frailty Screening Is Associated with Reduction in the Rate of 1-year Mortality after Elective Operation. Journal of the American College of Surgeons. 2020;231(4):S149-S150. doi:10.1016/j.jamcollsurg.2020.07.742

Workflow

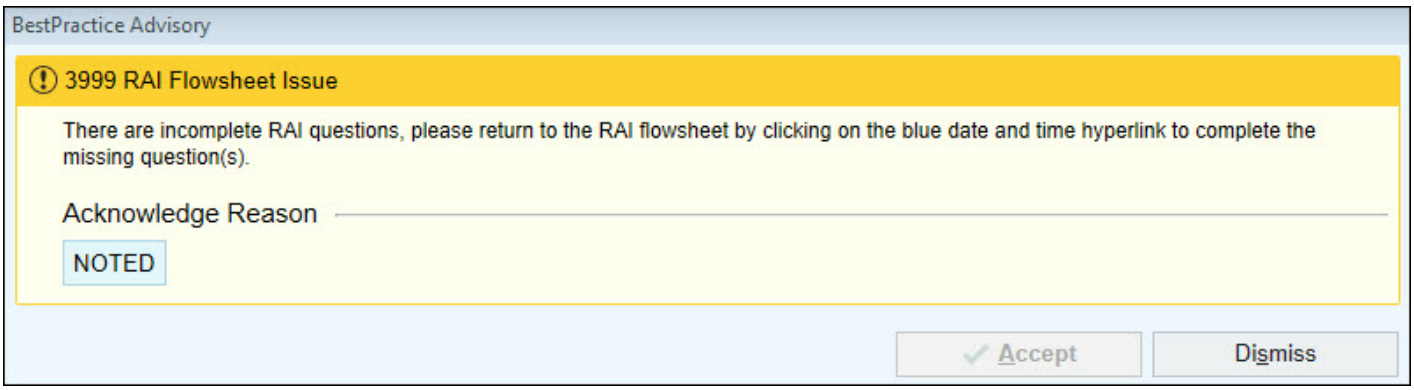
The following section describes similar workflows to the ones used at UPMC to implement the RAI scoring system in Epic and decrease surgical mortality rates.

Anita is a 70-year-old woman who is preparing for a knee replacement surgery. Before surgery, she has a pre-op visit at the clinic. When she arrives for her visit, she fills out a single-page version of the RAI survey written in sixth grade-level English. When she enters the exam room, the MA reviews her responses. The MA then opens Anita's chart and selects the Screenings tab, then the RAI tab. From this tab, the MA can enter the patient's responses in the RAI questionnaire.

To see the form UPMC uses, refer to the Appendix: One-Page RAI Screening Form topic.

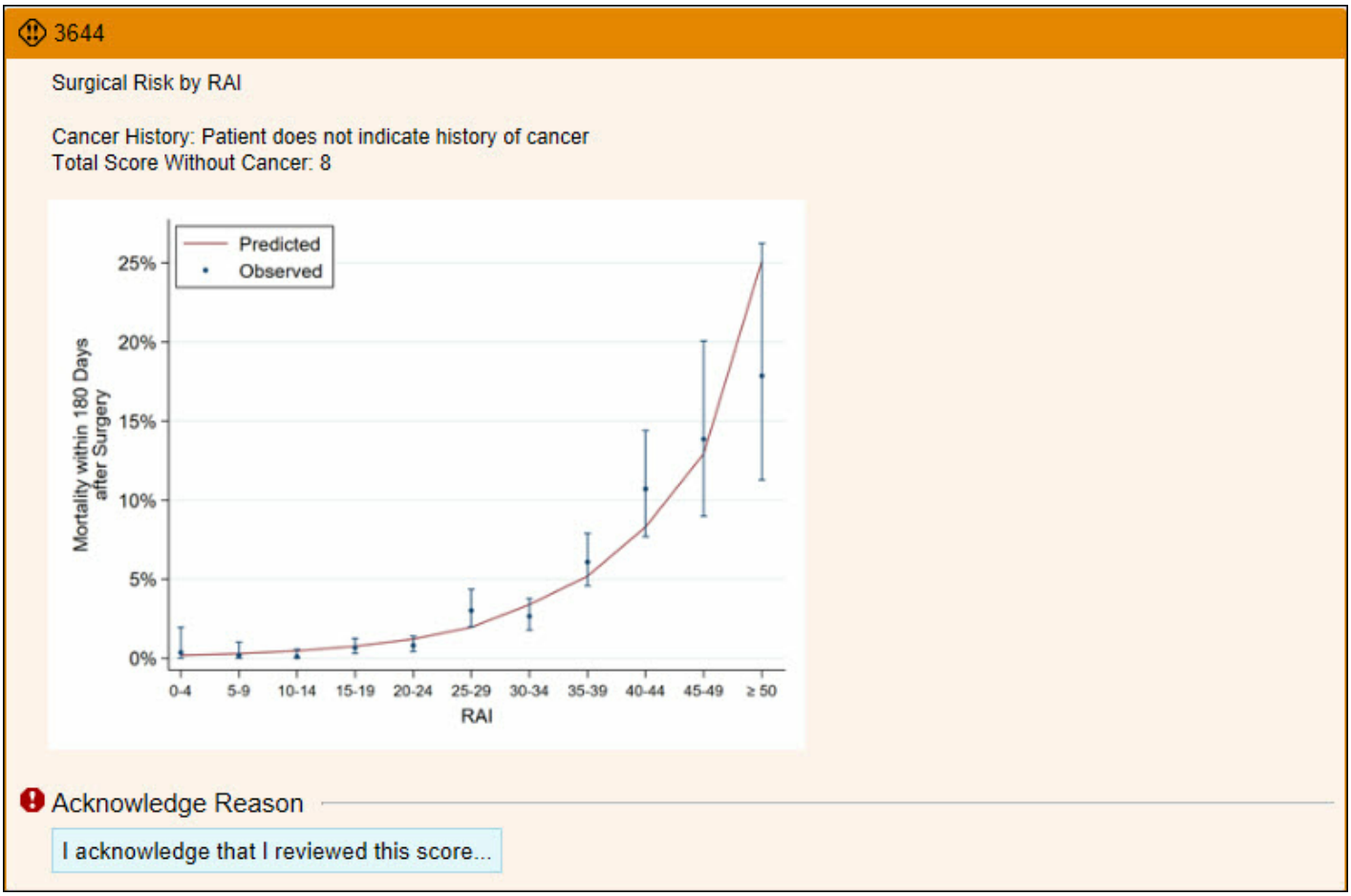


When the MA clicks Close, the system calculates the RAI score for the patient. If the MA misses a question, a BestPractice Advisory appears to remind her to complete the full questionnaire.

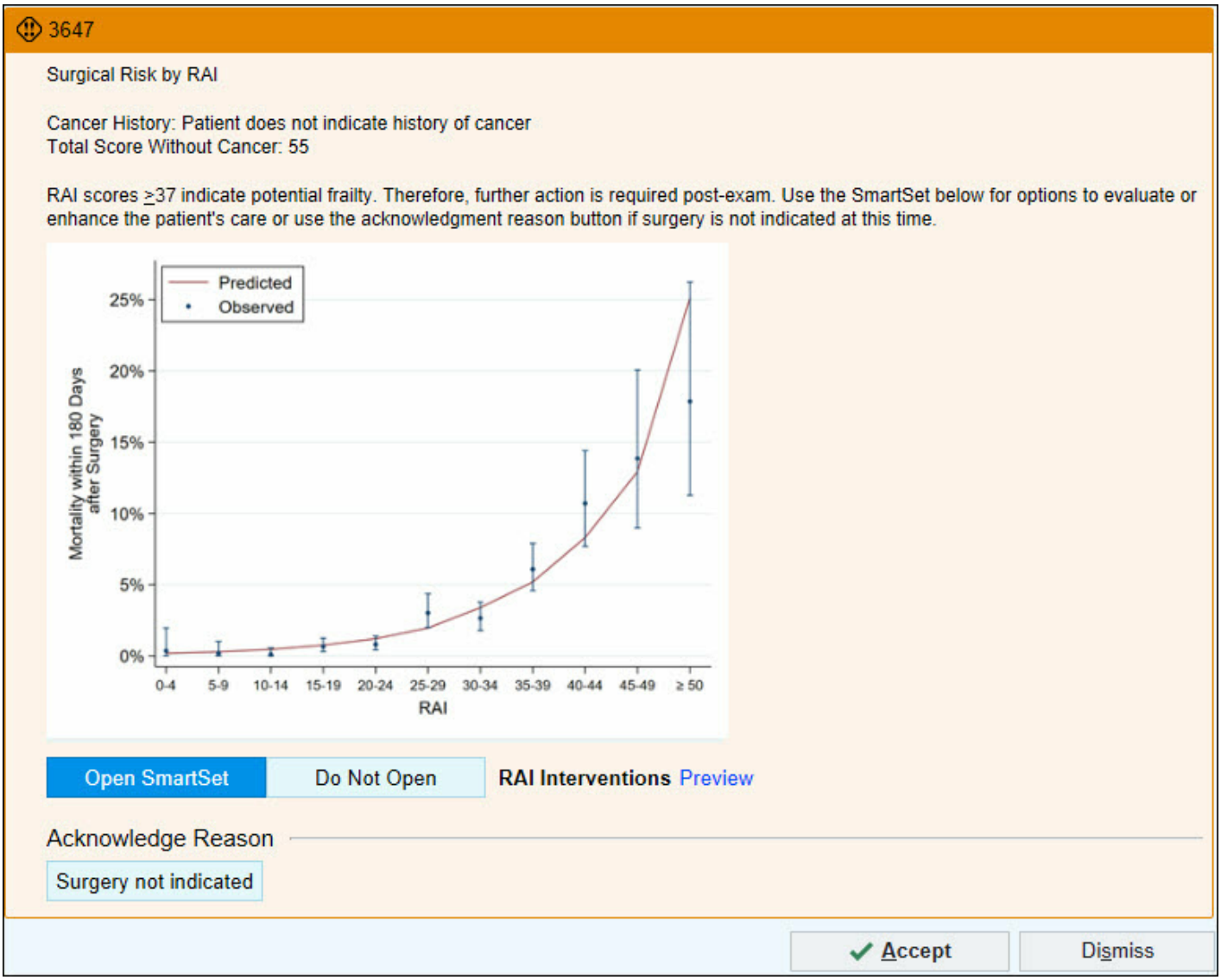


If the RAI score is over 37, the MA communicates this score to the physician immediately.

Anita's RAI score is 8, so when the surgeon logs in to Hyperspace and opens her chart, a BPA appears to remind her to review the score. The surgeon clicks the "I acknowledge that I reviewed this score" button and discusses the score with Anita. Since Anita's low RAI score indicates that she has a robust physiologic reserve, she and the surgeon decide to continue with the knee replacement surgery.



RAI scores over 37 indicate higher risks of mortality, readmission, and long-term ICU admission. Therefore, if Anita's RAI score had been over 37, a different BPA would have appeared, which would have guided the surgeon to a SmartSet to address her elevated risk. The SmartSet includes a referral to a multidisciplinary preoperative optimization clinic that can help Anita minimize her surgical risk.



Seeing This Feature in the Foundation System

We're planning to build the flowsheets and BestPractice Advisories for this program in the Foundation System in the near future. We'll update this section when we've released the build in the Foundation System.

Considerations

This section describes what you must decide as you plan your implementation of this feature.

Decide Which Patients Should Be Scored

Before you implement the RAI score, you need to decide which patients you want to screen for frailty. Screening patients at all your locations might not make sense for you, because the RAI is designed specifically to be used in pre-op decision-making. On the other hand, limiting the patients screened to a specific pre-op clinic or department might not include all the patients you want to screen.

UPMC chose to screen all ambulatory patients with a visit type of Pre-op in their clinics and hospital outpatient departments. They found that their workflow for RAI screening added only about 30 seconds to the existing clinic workflow, which suggests that it's more time-efficient to screen all patients than to implement a specific triage system to determine which patients should be assessed. Evaluate your visit types and determine which visit type makes the most sense for you to use. If you don't already have a specific visit type of Pre-op, you can create one by following the instructions in the Build Advanced Visit Types topic.

Decide How Clinicians Access the Scoring Section

After you decide which patients should be screened, you need to make sure clinicians can access the scoring tool easily during visits. UPMC put the scoring tool on the Screenings tab because that tab was easily accessible to specialties that see many pre-op patients for elective surgeries, such as orthopaedics and gastroenterology. Other departments and specialties that don't frequently use the Screenings tab can still access the tool using the Flowsheets activity. Epic recommends adding the scoring tool to your Screenings tab to make sure it's easily accessible to clinicians and doesn't require clinicians to change their workflows to find it.

Build Information

This section describes the steps you need to follow to create the tools for this program in your system. There are three main pieces to the build:

- RAI screening flowsheets
- BPAs to remind staff to complete the flowsheets
- BPAs to help surgeons address RAI scores

Build RAI Flowsheets

Create Documentation Rows

1. In Hyperspace, open the Doc Flowsheet Builder (search: Doc Flowsheet Builder).
2. Using the instructions in the Build a Flowsheet Row topic, create fourteen flowsheet rows. For each row:
   a. In the Row type (I FLO 815) field, enter 1-Data.
   b. In the Value type (I FLO 825) field, enter 8-Custom List.
   c. Select the Display all list choices in Navigator check box.
   d. Use the table below to enter values in the Display name (I FLO 805) field and the Value field on the Custom List form:

Display name	Values
Do you live in a place other than your own home?	0-No
	1-Yes
If yes, circle where:	Nursing Home
	Skilled Nursing Facility
	Assisted Living
	Other
When did you begin living in the place you are currently residing?	Less than three months
	Three months to one year
	Greater than one year ago
Any kidney failure, kidney not working well, or seeing a kidney doctor (nephrologist)? If yes, was this for kidney stones or another problem?	0-No

Display name	Values
	0-Kidney Stones
	8-Other (Comment)
	8-Both Kidney Stones and Other Problems
Any history of chronic (long-term) congestive heart failure (CHF)?	0-No
	5-Yes
Any shortness of breath when resting?	0-No
	5-Yes
In the past five years, have you been diagnosed with or treated for cancer?	No
	Yes
Have you lost weight of 10 pounds or more in the past 3 months without trying?	0-No
	4-Yes
Do you have any loss of appetite?	0-No
	4-Yes
During the last 3 months, has it become difficult for you to remember things or organize your thoughts?	0-No
	1-Yes
Getting around (mobility)	0-Can get around without any help
	1-Needs help from cane, walker, or scooter
	2-Needs help from others to get around the house or

Display name	Values
	neighborhood
	3-Needs help getting in or out of chair
	4-Totally dependent on others to get around
Eating	0-Can plan and prepare own meals
	1-Needs help planning meals
	2-Needs help preparing meals
	3-Needs help eating meals
	4-Totally dependent on others to eat meals
Toileting	0-Can use toilet without any help
	1-Needs help getting to or from toilet
	2-Needs help to use toilet paper
	3-Cannot use a standard toilet, with help can use bedpan/urinal
	4-Totally dependent on others for toileting
Personal hygiene (bathing, hand washing, changing clothes)	0-Can shower or bathe without any help
	1-Can shower or bathe without help when prompted
	2-Needs help preparing the tub

Display name	Values
	or shower
	3-Needs some help with some elements of washing
	4-Totally dependent on others to shower or bathe

3. Open the "Do you live in a place other than your own home?" row you created in the previous step.
4. On the Cascade/Jump Logic form, enter the following information:
   a. Comparison Operator: 3-Equal
   b. Comparison Value: 1
   c. Group/Row: Enter the "If yes, circle where:" row you created in step 2.
   d. Method: 1-Add Without Prompting Users

Create Calculation Rows

1. In Hyperspace, open the Doc Flowsheet Builder (search: Doc Flowsheet Builder).
2. Using the instructions in the Build a Flowsheet Row topic, create twelve additional flowsheet rows. For each row:
   a. In the Row type (I FLO 815) field, enter 3-Custom Formula.
   b. Use the table below to enter values in the Display name (I FLO 805) field, Custom formula (I FLO 1530) field, and the Value type (I FLO 825) field:

Display name	Formula	Formula details	Value type
Cancer History	M:$s({X}="No":"Patient does not indicate history of cancer", {X}="Yes":"Patient indicates history of cancer")	In the formula, substitute the ID of the "In the past five years, have you been diagnosed with or treated for cancer?" flowsheet row you created earlier for X.	2-String Type
RAI Age from EPT	M:({X}-{X}+$h-$$getn^elibEAnLIB(""EPT"",patID,1,""100;1""))\365.25	In the formula, substitute the ID of the " Do you live in a place other than your own home?" flowsheet row you created earlier for X.	1–Numeric Type
RAI Gender	m:({X}-{X}+$$getn^EAXLIB(""EPT"",patID,1,""100;2""))	In the formula, substitute the ID of the " Do you live in a place other than your own	1–Numeric Type

Display name	Formula	Formula details	Value type
from EPT		home?" flowsheet row you created earlier for X.	
RAI Gender Score	M:$S({X}=1:0,{X}=2:3,{X}>=3:3)	In the formula, substitute the ID of the "RAI Gender from EPT" flowsheet row you created earlier for X.	1–Numeric Type
RAI Without Cancer Score Table	M:$S({X}>=100:34,{X}>=95:32, {X}>=90:30,{X}>=85:28, {X}>=80:26,{X}>=75:24, {X}>=70:22,{X}>=65:20, {X}>=60:18,{X}>=55:16, {X}>=50:14,{X}>=45:12, {X}>=40:10,{X}>=35:8,{X}>=30:6, {X}>=25:4,{X}>=20:1,{X}>=0:0)	In the formula, substitute the ID of the "RAI Age from EPT" flowsheet row you created earlier for X.	1–Numeric Type
RAI ADL Score Table	{A}+{B}+{C}+{D}	For A, substitute the ID for your “Getting around (mobility)” flowsheet row For B, substitute the ID for your “Eating” flowsheet row For C, substitute the ID for your “Toileting” flowsheet row For D, substitute the ID for your “Personal hygiene (bathing, hand washing, changing clothes)” flowsheet row	1-Numeric Type
RAI Without Cognition Score Table	M:$S({X}=16:14,{X}=15:13, {X}=14:12,{X}=13:11,{X}=12:11, {X}=11:10,{X}=10:9,{X}=9:8, {X}=8:7,{X}=7:6,{X}=6:5,{X}=5:4, {X}=4:4,{X}=3:3,{X}=2:2,{X}=1:1, {X}=0:0)	In the formula, substitute the ID of the "RAI ADL Score Table" flowsheet row you created earlier for X.	1-Numeric Type

Display name	Formula	Formula details	Value type
RAI With Cognition Score	M:$S({X}=16:16,{X}=15:15, {X}=14:15,{X}=13:14,{X}=12:13, {X}=11:13,{X}=10:12,{X}=9:11, {X}=8:11,{X}=7:10,{X}=6:9,{X}=5:8, {X}=4:8,{X}=3:7,{X}=2:6,{X}=1:6, {X}=0:5)	In the formula, substitute the ID of the "RAI ADL Score Table" flowsheet row you created earlier for X.	1-Numeric Type
RAI Cancer Score Table	M:$S({X}=""Yes"":2,{X}=""No"":3)	In the formula, substitute the ID of the "In the past five years, have you been diagnosed with or treated for cancer?" flowsheet row you created earlier for X.	1-Numeric Type
Total Score Without Cancer	M:0,%CogCancer=$s({A;;}=0:{B;;}+ {C;;},1:{B;}+{D;;}),%Other= ({E;;}+ {F;;}+{G;;}+{H;;}+{I;;}+{J;;}+{K;;}),x= (%CogCancer+%Other)	For A, substitute the ID for your “During the last 3 months has it become difficult for you to remember things or organize your thoughts?” flowsheet row For B, substitute the ID for your “RAI Without Cancer Score Table” flowsheet row For C, substitute the ID for your “RAI Without Cognition Score Table” flowsheet row For D, substitute the ID for your “RAI With Cognition Score Table” flowsheet row For E, substitute the ID for your “RAI Gender Score” flowsheet row For F, substitute the ID for your "Do you live in a place other than your own home?" flowsheet row For G, substitute the ID for your “Any kidney failure, kidney not working well, or seeing a kidney doctor (nephrologist)? If yes, was this	1-Numeric Type

Display name	Formula	Formula details	Value type
		for kidney stones or another problem?" flowsheet row For H, substitute the ID for your "Any history of chronic (long-term) congestive heart failure (CHF)?" flowsheet row For I, substitute the ID for your "Any shortness of breath when resting?" flowsheet row For J, substitute the ID for your "Have you lost weight of 10 pounds or more in the past 3 months without trying?" flowsheet row For K, substitute the ID for your "Do you have any loss of appetite?" flowsheet row	
Total Score With Cancer	M:0,%CogCancer=$s({A;;}=0:{B;;}+{C;;},1:{B;;}+{D;;}),%Other= ({E;;}+{F;;}+{G;;}+{H;;}+{I;;}+{J;;}+{K;;}),x=(%CogCancer+%Other)	For A, substitute the ID for your "During the last 3 months has it become difficult for you to remember things or organize your thoughts?" flowsheet row For B, substitute the ID for your "RAI With Cancer Score Table" flowsheet row For C, substitute the ID for your "RAI Without Cognition Score Table" flowsheet row For D, substitute the ID for your "RAI With Cognition Score Table" flowsheet row For E, substitute the ID for your "RAI Gender Score" flowsheet row For F, substitute the ID for your "Do you live in a place other than your own home?" flowsheet row	**1-Numeric Type**

Display name	Formula	Formula details	Value type
		For G, substitute the ID for your "Any kidney failure, kidney not working well, or seeing a kidney doctor (nephrologist)? If yes, was this for kidney stones or another problem?" flowsheet row For H, substitute the ID for your "Any history of chronic (long-term) congestive heart failure (CHF)?" flowsheet row For I, substitute the ID for your "Any shortness of breath when resting?" flowsheet row For J, substitute the ID for your "Have you lost weight of 10 pounds or more in the past 3 months without trying?" flowsheet row For K, substitute the ID for your "Do you have any loss of appetite?" flowsheet row	
Total Score	M:$S({A}=2:{B},{A}=3:{C})	For A, substitute the ID for your "RAI Cancer Score Table" flowsheet row For B, substitute the ID for your "Total Score With Cancer" flowsheet row For C, substitute the ID for your "Total Score Without Cancer" flowsheet row	1-Numeric Type

Assemble the Rows into Flowsheet Groups

1. In Hyperspace, open the Doc Flowsheet Builder (search: Doc Flowsheet Builder).
2. Create a flowsheet group. In the Row type (I FLO 815) field, enter 2-Flowsheet Group.
3. In the Display name (I FLO 805) field, enter Where You Live.
4. On the Group form, enter the following rows you created earlier, in the following order:
    - Do you live in a place other than your own home?

- If yes, circle where:
- When did you begin living in the place you are currently residing?

5. Select the Start Removed check box for the "If yes, circle where:" row.
6. Create a second flowsheet group. In the Row type (I FLO 815) field, enter 2-Flowsheet Group.
7. In the Display name (I FLO 805) field, enter Medical Conditions.
8. On the Group form, enter the following rows you created earlier, in the following order:
   - Any kidney failure, kidney not working well, or seeing a kidney doctor (nephrologist)? If yes, was this for kidney stones or another problem?
   - Any history of chronic (long-term) congestive heart failure (CHF)?
   - Any shortness of breath when resting?
   - In the past five years, have you been diagnosed with or treated for cancer?
9. Create a third flowsheet group. In the Row type (I FLO 815) field, enter 2-Flowsheet Group.
10. In the Display name (I FLO 805) field, enter Nutrition.
11. On the Group form, enter the following rows you created earlier, in the following order:
    - Have you lost weight of 10 pounds or more in the past 3 months without trying?
    - Do you have any loss of appetite?
12. Create a fourth flowsheet group. In the Row type (I FLO 815) field, enter 2-Flowsheet Group.
13. In the Display name (I FLO 805) field, enter Cognitive.
14. On the Group form, enter the During the last 3 months has it become difficult for you to remember things or organize your thoughts? row you created earlier.
15. Create a fifth flowsheet group. In the Row type (I FLO 815) field, enter 2-Flowsheet Group.
16. In the Display name (I FLO 805) field, enter Activities of Daily Living.
17. On the Group form, enter the following rows you created earlier, in the following order:
    - Getting around (mobility)
    - Eating
    - Toileting
    - Personal hygiene (bathing, hand washing, changing clothes)
18. Create a sixth flowsheet group. In the Row type (I FLO 815) field, enter 2-Flowsheet Group.
19. In the Display name (I FLO 805) field, enter Risk Analysis Index (RAI) Score - Immediately inform the surgeon and/or PA if the score is greater than or equal to 37.
20. On the Group form, enter the following rows you created earlier, in the following order:
    - Cancer History
    - Total Score Without Cancer
    - Total Score

Assemble the Groups into a Flowsheet Template

1. In Hyperspace, open the Doc Flowsheet Builder (search: Doc Flowsheet Builder).
2. Create a flowsheet template.

3. In the Display name (I FLT 7) field, enter the name you want to appear to clinicians when they select the flowsheet, such as RAI.
4. In the Group/Row (I FLT 1000) field, enter the six flowsheet groups you created earlier, in the order in which you created them.

Remind Support Staff to Complete RAI Flowsheets

Create Criteria Records to Evaluate Whether Reponses Are Missing

Your BPA needs to evaluate whether responses are missing for the RAI flowsheets, but it also shouldn't return true when no value is entered any RAI flowsheets, because then the BPA appears for all patients who haven't yet been evaluated. To do this, you need to create a criteria record to evaluate whether the Total RAI Score flowsheet row is populated.

1. In Hyperspace, create a new BPA criteria record (search: BestPractice Advisory).
2. On the Criteria form, click Add Criteria Type. Select the Flowsheets option. Click Accept.
3. In the Flowsheet Row (I LGL 650) field, enter the Total Score calculation row you created earlier.
4. Enter 7-null in the Function (I LGL 660) field.
5. Select the Released (I LGL 70) check box.

Create a Base Record to Evaluate Whether Responses Are Missing

Now, put your criteria record into a base record so that the system can find patients who meet the linked criteria.

1. In Hyperspace, create a new BPA base record (search: BestPractice Advisory).
2. In either the Unformatted Display Text (I LGL 61) field or Formatted Display Text (I LGL 52) field, enter the text you want to show to the user when the BPA appears, such as “There are incomplete RAI questions. Please return to the flowsheet and complete the missing questions.”
3. In the Linked Criteria (I LGL 3000) field, enter the criteria record you created earlier.
4. In the Trigger (I LGL) field, enter 5-General BPA section.
5. Select the Override profile frequency (I LGL 2020) check box.
6. In the Acknowledgement Reason (I LGL 4000) field, enter a reason for acknowledgement. If you want to create your own reason, complete both of these steps:
    a. In Hyperspace, add the reason to the Allowed Acknowledge Reasons (I LGL 4000) category list. For instructions, refer to the Add a Value to a Category List topic.
    b. In Clinical Administration, add the reason to the Acknowledge reasons for BPAs (I LSD 2645) field in EMR System Definitions (Management Options > Edit System Definitions (LSD)) to make them available for selection.
7. In the Button (I LGL 4010) field, enter Yes.
8. Select the Released (I LGL 70) check box.

Prompt Clinicians to Address RAI Scores

Identify or Create a SmartData Element

Before you begin building your BPAs and SmartSet, you need to identify or create a SmartData element to hold data about whether the clinician acknowledged your BPA. This SmartData element can help you report on BPA compliance and see trends in clinician use of the BPA. For more information about identifying existing SmartData elements or creating your own, refer to the SmartForms Setup: Manage SmartData Elements topic.

We recommend using Epic-released SmartData element EPIC#31000215718-RiskAnalysis Index Reviewed.

Create Documentation SmartTexts

First, create two new SmartTexts. One SmartText should include the statement that clinicians add to a note when surgery is not indicated for a patient based on their RAI score. UPMC uses the following text: "I have reviewed with the patient their increased risk for perioperative morbidity, mortality, and loss of independence. We decided that surgery is not consistent with the patient's values or goals."

The second SmartText should include the text that clinicians add to a note to indicate that shared decision-making between the patient and provider led to the chosen surgical indication. UPMC uses the following text: "I have reviewed with the patient their increased risk for perioperative morbidity, mortality, and loss of independence. We discussed the patient's goals, including what she wants to avoid if the surgery does not go as expected. We developed a shared plan for surgery and perioperative care as documented in my clinic note/letter/dictation."

Refer to the Create and Edit a SmartText topic for instructions to create SmartTexts.

Create the RAI Interventions SmartSet

1. In Hyperspace, open the SmartGroup Editor (search: SmartGroup).
2. Create a new SmartGroup for decision documentation.
3. On the Configuration tab, click Add Item and add a SmartText item.
4. In the SmartText field, enter one of the SmartTexts you created earlier.
5. In the Filing Type field, enter 1-Progress Notes/Telephone Documentation.
6. Repeat steps 3-5 for the second SmartText you created earlier.
7. In Hyperspace, open the SmartGroup Editor (search: SmartGroup).
8. Create a new SmartGroup for your referrals.
9. On the Configuration tab, click Add Item and add an Ambulatory Order item.
10. In the Order field, enter a referral order. Repeat steps 1-4 for each referral you want to include in your RAI interventions SmartSet. For example, UPMC includes the following referrals in their SmartSet:
    - Center for Pre-Surgical Care (CPC)
    - Primary care physician
    - Musculoskeletal Health
11. Follow the steps in the Build Your SmartSets and Order Sets topic to create a SmartSet that uses these two SmartGroups.

Create the BestPractice Advisories

Next, create the BPAs that alert physicians to review the patient's RAI. UMPC created four BPAs, one for each of the following scenarios:

- The patient has a no history of cancer and has an RAI score under 37.
- The patient has a history of cancer and has an RAI score under 37.
- The patient has a no history of cancer and has an RAI score equal to or greater than 37.
- The patient has a history of cancer and has an RAI score equal to or greater than 37.

Create Criteria Records to Evaluate Patients' RAI Scores and Cancer Responses

In Hyperspace, create six BPA criteria records (search: BestPractice Advisory). For each criteria record:

1. On the Criteria form, click Add Criteria Type. Select the Flowsheets option. Click Accept.
    a. Use the table below to enter values in the Flowsheet Row (I LGL 650) field, the Function (I LGL 660) field, and the Value (I LGL 655) field:

Criteria Record	Flowsheet Row (I LGL 650) field	Function (I LGL 660) field	Value (I LGL 655) field
A	The Cancer History calculation row you created in the Build RAI Flowsheets topic	1-Equal to	No
B	The Total Score calculation row you created in the Build RAI Flowsheets topic	3-Greater than or equal to	37
C	The Total Score calculation row you created in the Build RAI Flowsheets topic	5-Less than	37
D	The Total Score Without Cancer calculation row you created in the Build RAI Flowsheets topic	3-Greater than or equal to	37
E	The Total Score Without Cancer calculation row you created in the Build RAI Flowsheets topic	5-Less than	37
F	The Total Score Without Cancer calculation row you created in the Build RAI Flowsheets topic	3-Greater than or equal to	0

2. Select the Released (I LGL 70) check box.

Create A Base Record for Patients with No Cancer History and an RAI Score of Less Than 37

1. In Hyperspace, create a BPA base record (search: BestPractice Advisory). Select the Criteria form.
2. In the Linked Criteria (I LGL 3000) field, enter the following criteria records you created above in the following order:
    a. F
    b. E
    c. A
3. Leave the Logic (I LGL 3100) field blank.
4. On the Triggers form, enter the following values in the Trigger (I LGL 78) field:
    - 16-Reporting Workbench
    - 5-General BPA Section
5. Select the Override profile frequency (I LGL 2020) check box.
6. On the Acknowledge Reasons form, enter 43-Patient contraindication in the Acknowledge Reason (I LGL

4000) field.

7. In the Applies to (I LGL 4020) field, enter All users, current encounter only
8. In the Lockout (I LGL 4005) field, enter 48. In the Unit (I LGL 4005) field, enter Hours.
9. In the Button? (I LGL 4010) field, enter Yes.
10. In the Button Caption (I LGL 4015) field, enter the following text: I acknowledge that I reviewed this score.
11. In the SmartData Element field, click the pencil icon and select the SmartData element you created or identified earlier.
12. In the Context (I LGL 4026) field, enter 2-Encounter.
13. In the Value (I LGL 4028) field, enter Yes.
14. Select the Released (I LGL 70) check box.

Create A Base Record for Patients with Cancer History and an RAI Score of Less Than 37

1. In Hyperspace, create a BPA base record (search: BestPractice Advisory). Select the Display form.
2. Configure the Unformatted Display Text (I LGL 61) and Formatted Display Text (I LGL 52) fields to show the text you want clinicians to see when the BPA appears. UPMC uses the following language when presenting both scores for patients with a cancer history: Previous answers on this form indicate that the patient has a history of cancer. If the patient's cancer is unresectable, metastatic or carries a poor prognosis, the cancer should be considered "frailty-relevant" and increase the RAI score. If, however, the patient's cancer is minor or definitively treated such that it does not impact long term survival or frailty, the cancer should not increase the RAI score.
    - RAI Score: [value] (We recommend considering this higher score if the patient's cancer is unresectable, metastatic or carries a poor prognosis)
    - RAI Score (without cancer): [value] (We recommend considering this lower score if the patient's cancer is minor or definitively treated such that it does not impact long term survival or frailty.)
    - Scores ≥37 indicate significant frailty and should be discussed with the physician and patient.
3. On the Criteria form, in the Linked Criteria (I LGL 3000) field, enter the following criteria records you created above in the following order:
    a. C
    b. A
4. In the Logic (I LGL 3100) field, enter 1 AND NOT 2.
5. On the Triggers form, enter the following values in the Trigger (I LGL 78) field:
    - 16-Reporting Workbench
    - 5-General BPA Section
6. Select the Override profile frequency (I LGL 2020) check box.
7. On the Acknowledge Reasons form, enter 43-Patient contraindication in the Acknowledge Reason (I LGL 4000) field.
8. In the Applies to (I LGL 4020) field, enter All users, current encounter only.
9. In the Lockout (I LGL 4005) field, enter 48. In the Unit (I LGL 4005) field, enter Hours.
10. In the Button? (I LGL 4010) field, enter Yes.
11. In the Button Caption (I LGL 4015) field, enter the following text: I acknowledge that I reviewed this score.
12. In the SmartData Element field, click the pencil icon and select the SmartData element you created or

identified earlier.

13. In the Context (I LGL 4026) field, enter 2-Encounter.
14. In the Value (I LGL 4028) field, enter Yes.
15. Select the Released (I LGL 70) check box.

Create A Base Record for Patients with No Cancer History and an RAI Score Equal to or Greater Than 37

1. In Hyperspace, create a BPA base record (search: BestPractice Advisory). Select the Criteria form.
2. In the Linked Criteria (I LGL 3000) field, enter the following criteria records you created above in the following order:
   a. D
   b. A
3. Leave the Logic (I LGL 3100) field blank.
4. On the Triggers form, enter the following values in the Trigger (I LGL 78) field:
   - 16-Reporting Workbench
   - 5-General BPA Section
5. Select the Override profile frequency (I LGL 2020) check box.
6. On the Actions form, click Add Action Type and add a SmartSets, Order Sets, and Pathways action. In the SmartSets, Order Sets, add Pathways (I LGL 105) field, enter the RAI Interventional SmartSet you created earlier. In the Open As (I LGL 103) field, enter 1-SmartSet.
7. On the Acknowledge Reasons form, enter 43-Patient contraindication in the Acknowledge Reason (I LGL 4000) field.
8. In the Applies to (I LGL 4020) field, enter All users, current encounter only.
9. In the Lockout (I LGL 4005) field, enter 48. In the Unit (I LGL 4005) field, enter Hours.
10. In the Button? (I LGL 4010) field, enter Yes.
11. In the Button Caption (I LGL 4015) field, enter the following text: I acknowledge that I reviewed this score.
12. In the SmartData Element field, click the pencil icon and select the SmartData element you created or identified earlier.
13. In the Context (I LGL 4026) field, enter 2-Encounter.
14. In the Value (I LGL 4028) field, enter Yes.
15. Select the Released (I LGL 70) check box.

Create A Base Record for Patients with Cancer History and an RAI Score Equal to or Greater Than 37

1. In Hyperspace, create a BPA base record (search: BestPractice Advisory). Select the Display form.
2. Configure the Unformatted Display Text (I LGL 61) and Formatted Display Text (I LGL 52) fields to show the text you want clinicians to see when the BPA appears. UPMC uses the following language when presenting both scores for patients with a cancer history: Previous answers on this form indicate that the patient has a history of cancer. If the patient's cancer is unresectable, metastatic or carries a poor prognosis, the cancer should be considered "frailty-relevant" and increase the RAI score. If, however, the patient's cancer is minor or definitively treated such that it does not impact long term survival or frailty, the cancer should not increase the RAI score.
   - RAI Score: [value] (We recommend considering this higher score if the patient’s cancer is unresectable, metastatic or carries a poor prognosis)

- RAI Score (without cancer): [value] (We recommend considering this lower score if the patient's cancer is minor or definitively treated such that it does not impact long term survival or frailty.)
- Scores ≥37 indicate significant frailty and should be discussed with the physician and patient.

3. On the Criteria form, in the Linked Criteria (I LGL 3000) field, enter the following criteria records you created above in the following order:
   a. B
   b. A
4. In the Logic (I LGL 3100) field, enter 1 AND NOT 2.
5. On the Triggers form, enter the following values in the Trigger (I LGL 78) field:
   - 16-Reporting Workbench
   - 5-General BPA Section
6. Select the Override profile frequency (I LGL 2020) check box.
7. On the Actions form, click Add Action Type and add a SmartSets, Order Sets, and Pathways action. In the SmartSets, Order Sets, add Pathways (I LGL 105) field, enter the RAI Interventional SmartSet you created earlier. In the Open As (I LGL 103) field, enter 1-SmartSet.
8. On the Acknowledge Reasons form, enter 43-Patient contraindication in the Acknowledge Reason (I LGL 4000) field.
9. In the Applies to (I LGL 4020) field, enter All users, current encounter only.
10. In the Lockout (I LGL 4005) field, enter 48. In the Unit (I LGL 4005) field, enter Hours.
11. In the Button? (I LGL 4010) field, enter Yes.
12. In the Button Caption (I LGL 4015) field, enter the following text: I acknowledge that I reviewed this score.
13. In the SmartData Element field, click the pencil icon and select the SmartData element you created or identified earlier.
14. In the Context (I LGL 4026) field, enter 2-Encounter.
15. In the Value (I LGL 4028) field, enter Yes.
16. Select the Released (I LGL 70) check box.

Validate Your Build

Your validation process should consider the details of your build. To validate your build, Epic recommends that you run through some example workflows, like the one in the Workflow section above.

Make sure to test that the following workflows can be completed:

- Clinicians can document data in RAI flowsheets.
- The RAI score is calculated accurately, both with and without a cancer diagnosis documented.
- A BPA appears when a clinician closes the flowsheet without completing documentation.
- Appropriate BPAs appear depending on the patient's RAI score.
- BPAs appear only in the correct contexts and not to any providers that don’t need to see them.
- Clinicians can place orders and write notes using the SmartSet.
- SmartText wording meets the needs of your organization’s surgeons.

Training

UPMC trained MAs and PAs to document the elements of the RAI score and alert physicians of any high scores. They also trained surgeons to interpret the score and complete follow-up actions. Clinicians also need to understand how to use the score in clinical decision-making and how to initiate discussions with patients about the score. UPMC created the following training materials for both surgeons and support staff:

- Tip sheets. You might create a tip sheet for MAs and PAs with steps to find the RAI tab and document the elements, and another one for surgeons with steps to follow up on BPAs.
- Webinars. UPMC held live webinars to show clinicians how to use the RAI tools and recorded the webinars to allow clinicians to view them any time. The Pre-Operative Frailty Screening and Prehabilitation: Implementing the Risk Analysis Index (RAI) video from the Veterans Health Administration ais publicly available on YouTube to explain the concepts and the science behind the RAI score.

Measure Your Success

Your organization can use reports built from Reporting Workbench report template 17700-BestPractice Advisory Usage to see how often your RAI BPAs are firing, which actions clinicians take on these BPAs, and what dismissal reasons clinicians list for dismissing the BPAs.

To get an idea of whether the program was having a positive effect on patient outcomes, UPMC measured their readmission rates and average length of stay before and after the program's implementation. You can use the following tools to measure your readmission rates:

- Radar dashboard component 34601-IP Trending Readmission Metrics. Use this dashboard component to see a number of readmission metrics and benchmarks.
- Radar dashboard component 34201-IP Physician Trending Outcome Metrics. Clinicians can use this dashboard component to monitor their own individual readmission rates.
- Foundation System report 115216-IP Find Readmitted Patients (Last 30 Days). Use this report to identify admitted patients who were discharged from a previous admission within 30 days of the current admission.

You can use the following tools to measure your length-of-stay averages:

- Radar dashboard component 56184-OR Estimated Post-Op ICU Bed Requirements. Use this dashboard component to see the estimated number of ICU beds needed for post-surgery patients based on historical admission rate and length of stay. Monitoring this component can help you see whether this program has positively impacted your ICU bed capacity.

You and your users can also use the Surgeries and Invasive Procedures data model to create ad hoc SlicerDicer reports and visualizations and explore surgery outcomes at your organization.

Appendix: One-Page RAI Screening Form

RAI Screening Assessment

Instructions: Please answer the following questions to the best of your ability. Your advocate or companion can help you complete this survey.

Where You Live

1. Do you live in place other than your own home?
   - No
   - Yes

   If Yes, circle where:

   - Nursing Home
   - Skilled Nursing Facility
   - Assisted Living
   - Other:

   When did you begin living in the place you are currently residing?

   - Less than 3 months
   - 3 months to 1 year
   - Greater than one year ago

Medical Conditions

2. Any kidney failure, kidney not working well, or seeing a kidney doctor (nephrologist)?
   - No
   - Yes

   If yes circle one: was your nephrologist visit for:

   - Kidney stones
   - Other
   - Both Kidney Stones and Other problem
3. Any history of chronic (long-term) congestive heart failure (CHF)?
   - No
   - Yes
4. Any shortness of breath when resting?
   - No
   - Yes

   Do you have trouble catching your breath when resting or doing minimal activities, like walking to the bathroom?

   - No
   - Yes

5. In the past five years, have you been diagnosed with or treated for cancer? Please answer "Yes" if the clinic visit today is to discuss the possibility of cancer surgery.
    - No
    - Yes

Nutrition

6. Have you lost weight of 10 pounds or more in the past 3 months without trying?
    - No
    - Yes

    Are your clothes feeling looser than in the past?

7. Do you have any loss of appetite?
    - No
    - Yes

    Do you or your family notice that you are not eating as much?

    - No
    - Yes

Cognitive

8. During the last 3 months has it become difficult for you to remember things or organize your thoughts?
    - No
    - Yes

Activities of Daily Living

9. Getting around (mobility):
    - Can get around without any help
    - Needs help from a cane, walker or scooter
    - Needs Help from others to get around the house or neighborhood
    - Needs help getting in or out of a chair
    - Totally dependent on others to get around
10. Eating:
    - Can plan and prepare own meals
    - Needs help planning meals
    - Needs help preparing meals
    - Needs help eating meals
    - Totally dependent on others to eat meals
11. Toileting:
    - Can use toilet without help
    - Needs help getting to or from toilet
    - Needs help to use toilet paper
    - Cannot use a standard toilet, with help can use bedpan/urinal

- Totally dependent on others for toileting

12. Personal hygiene (bathing, hand washing, changing clothes):
    - Can shower or bathe without prompt or help
    - Can shower or bathe without help when prompted
    - Needs help preparing the tub or shower
    - Needs some help with some elements of washing
    - Totally dependent on others to shower or bathe

Nurse Review:

Print Name:
Form Completed by:

- Patient
- Other: