

FOTO Functional Status Measures Risk Adjustment Procedures for NQF Short Forms

First, collect the data:

The FOTO outcomes data collection process uses patient self-reported computerized adaptive testing (CAT) or paper and pencil short form surveys. Logging on to the appropriate website (<http://www.fotoinc.com/>) provides an automated data collection process. But if you prefer the old fashioned paper and pencil method, follow these instructions.

Administration of each paper and pencil survey is simple. A staff member introduces the outcomes data collection process and presents the short form to the patient. The staff member requests the patient answer all questions, and directs the patient to answer according to how the patient is functioning now related to the problem for which they are receiving treatment. The patient simply reads the instructions on the survey, reads the questions and selects a response to each question. Responses relate to the level of difficulty or limitation the patient is having performing each task now. Although standard definitions of the response wording are not provided, this method of wording patient self-report questions is well researched, and current research efforts confirm the validity of this method. Patient responses are summed and a cross-walk table is used to determine an unadjusted functional status (FS) Measure. The CAT produces a mathematically linked, similar unadjusted FS Measure.

Then risk adjust the measures:

Each FS measure can be risk adjusted at intake and discharge. Risk-adjusted residual scores (unadjusted Discharge FS Measure minus risk-adjusted predicted Discharge FS Measure) of the Discharge FS Measure provide an estimate of risk-adjusted functional status change for each patient, which can be aggregated and averaged at the clinician level for between clinician comparisons. The risk-adjustment procedures will require data be collected for each risk-adjustment variable (see Risk-Adjustment Variables below), for example, patient age. If the risk-adjustment data are not collected, the measures cannot be risk adjusted using the beta coefficients presented below. Without risk adjustment, we do not recommend clinician-level aggregation and comparisons across clinicians.

To risk adjust the measures, complete the following steps:

1. A staff member identifies the short form survey that is appropriate for the patient, for example, patients with lumbar spine impairments complete the lumbar short form.
2. The patient (or proxy) completes the correct self-report survey. Identify the survey as either an intake or discharge survey.
3. A staff member sums the patient's responses to each short form survey question.
4. The staff member collects data for all risk-adjustment variables on the appropriate Risk-Adjustment Calculation Table, for example, patient age (see the Risk-Adjustment Calculation Tables and Risk-Adjustment Variable list for the risk-adjustment variables to be collected).
5. A staff member finds the summed score on the short form scoring algorithm table.

6. A staff member identifies the FS measure to the right of the summed score (identify intake and discharge measures).
7. A staff member identifies the appropriate value for each risk-adjustment variable in the appropriate Risk-Adjustment Calculation Table for either an intake or discharge measure.
8. Pencil in the response for each risk-adjustment variable in the 'Response' column (keep intake and discharge data separate).
9. Determine the 'Predicted Value' at intake. For variables where the patient selects one category response, like male gender, place the beta coefficient in the 'Predicted Value' column. For example, for a male with a hip impairment where fear-avoidance beliefs was not assessed, the beta coefficient at intake is -0.253 (pay attention to the sign before the beta coefficient!). For age, multiply the patient's age by the beta coefficient, and enter the product as the 'Predicted Value'. For example, for a 47 year old patient with a hip impairment where fear-avoidance beliefs was not assessed, the 'Predicted Value' is $47 \times (-0.13) = -6.11$. Place -6.11 in the 'Predicted Value' box for age.
10. When risk adjusting the discharge FS measure, follow the intake procedure, with the exception of adding the intake FS measure. When entering the intake FS measure, use the FS Measure from the Short Form Scoring Algorithm (NOT the risk-adjusted predicted intake measure).
11. To calculate the risk-adjusted FS measure at either intake or discharge, add the 'Predicted Value' for each variable plus the constant (and for discharge, add the 'Predicted Value' related to the intake FS Measure). There should be only one 'Predicted Value' per variable.
12. To calculate the risk-adjusted residual score, subtract the 'risk-adjusted predicted FS measure from the Risk-Adjustment Calculation Table' from the 'unadjusted FS Measure from the Scoring Algorithm table'. The risk-adjusted residual score is the risk-adjusted FS measure for among clinician comparisons.

Risk-Adjustment Variables

1. Gender: male vs. female
2. Symptom Onset (symptom acuity): the number of calendar days between date of onset of symptoms and date of initial evaluation. Coded as 0 to 7 days, 8 to 14 days, 15 to 21 days, 22 to 90 days, 91 days to 6 months, and over 6 months.
3. Age in years.
4. Surgery: surgical history, coded as no surgery for the primary condition being treated vs. 1 or more surgical procedures for the primary condition being treated.
5. Payer: source of payment for the therapy services, coded as PPO (Preferred Provider Organization), Indemnity (fee-for-service) plans, Litigation (patient is involved with an attorney to settle the claim and identify who is responsible for the treatment), Medicaid, Medicare Part A, Medicare Part B, Patient (patient private pay), HMO (Health Maintenance Organization), and Other.
6. Number of Functional Comorbid Conditions (FCI): Dianne L. Groll et al (The development of a comorbidity index with physical function as the outcome. *J Clin Epidemiol* 2005;58:595-602) developed a list of comorbid conditions related to physical functioning. Simply sum the number of comorbid conditions present and use the quartile of the number of comorbid conditions (coded as none, 1, 2 or 3, or 4 or more comorbid conditions) as the risk-adjustment variable, which is a proxy for condition severity. The comorbid conditions include a history of arthritis (rheumatoid or osteoarthritis), osteoporosis, asthma, chronic obstructive pulmonary disease, angina, congestive heart failure, heart attack, neurological disease, stroke or TIA, peripheral vascular disease, diabetes types I and II, upper gastrointestinal disease, depression, anxiety or panic disorders, visual impairment, hearing impairment, degenerative disc disease, and obesity and/or body mass index >30.
7. Fear-Avoidance Beliefs of Physical Activities: Gordon Waddell et al (A fear-avoidance beliefs questionnaire (FABQ) and the role of fear-avoidance beliefs in chronic low back pain and disability. *Pain* 1993;52(2):157-168) developed a survey that assesses the level of fear of performing physical activities. Four items are used: 'Physical activity makes my pain worse'; 'Physical activity might harm me'; 'I should not do physical activities which (might) make my pain worse'; and 'I cannot do physical activities which (might) make my pain worse'. The second item was edited to eliminate the reference to the back. Responses are 0 (Completely disagree), 1, 2, 3 (Unsure), 4, 5, 6 (Completely agree). The patient answers all four items by selecting a 0 to 6 response. Responses are summed. Total summative scores run from 0 to 24. Level of fear is dichotomized on the median as low fear (summative scores 0 to 13) vs. high fear (summative scores 14 to 24). FABQ can be assessed in patients who have as well as patients who do not have pain.
8. Intake FS Measure: Only for predicting risk-adjusted discharge FS measure. The intake FS measure is entered from the Scoring Algorithm table.

FOTO Hip Functional Status Risk-Adjustment Calculation Table. Use this table if the patient has a hip impairment.

Variable	Intake			Discharge		
	Response	Beta coef.	Predicted Value	Response	Beta coef.	Predicted Value
Gender (select one)						
Male		0			0	
Female		-2.75			-1.02	
Symptom Onset (select one)						
0 to 7 days		0			0	
8 to 14 days		.58			4.50	
15 to 21 days		5.19			-2.18	
22 to 90 days		3.34			2.58	
91 days to 6 mos		5.31			1.73	
over 6 mos		7.33			-4.43	
Age (enter age)		-.17			-.14	
Surgery (select one)						
0		0			0	
1 or more		-7.57			-5.15	
Payer (select one)						
PPO		0			0	
Indemnity		-.26			3.15	
Litigation		0			0	
Medicaid		-9.09			-1.95	
Medicare Part A		-2.23			-3.39	
Medicare Part B		.21			3.00	
Patient		-4.13			4.03	
HMO		4.01			2.18	
WC		-11.69			-9.78	
Other		2.52			.48	
FCI (select one)						
0		0			0	
1		-1.81			.67	
2 or 3		-4.40			-3.37	
4 or more		-5.51			-5.51	
FABQ (select one)						
Low		0			0	
High		-4.18			-.70	
Constant (constant is provided)			62.24			53.74
			Enter Intake FS Measure		.48	

Risk-Adjusted Predicted FS Measure						
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coef=coefficient. PPO=Preferred Provider Organization. HMO=Health Maintenance Organization. WC=Workers' Compensation. mos=months. FCI=Functional Comorbidity Index. FS=functional status.

FOTO Knee Functional Status Risk-Adjustment Calculation Table. Use this table if the patient has a knee impairment.

Variable	Intake			Discharge		
	Response	Beta coef.	Predicted Value	Response	Beta coef.	Predicted Value
Gender (select one)						
Male		0			0	
Female		-2.47			-2.97	
Symptom Onset (select one)						
0 to 7 days		0			0	
8 to 14 days		8.44			-3.37	
15 to 21 days		10.51			-4.26	
22 to 90 days		12.51			-4.31	
91 days to 6 mos		15.79			-6.43	
over 6 mos		13.16			-9.31	
Age (enter age)		-.06			-.17	
Surgery (select one)						
0		0			0	
1 or more		-7.17			1.99	
Payer (select one)						
PPO		0			0	
Indemnity		3.60			.29	
Litigation		-14.68			-14.81	
Medicaid		-.59			-3.93	
Medicare Part A		-1.22			.43	
Medicare Part B		.30			.64	
Patient		-14.42			-9.47	
HMO		2.78			1.36	
WC		-3.79			-4.92	
Other		-2.96			-2.34	
FCI (select one)						
0		0			0	
1		-.56			1.46	
2 or 3		-1.17			-2.38	
4 or more		-5.64			-4.04	
FABQ (select one)						
Low		0			0	
High		-3.96			-.78	
Constant (constant is provided)			44.40			57.88
			Enter Intake FS Measure		.51	

Risk-Adjusted Predicted FS Measure						
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coef=coefficient. PPO=Preferred Provider Organization. HMO=Health Maintenance Organization. WC=Workers' Compensation. mos=months. FCI=Functional Comorbidity Index. FS=functional status.

FOTO Foot/Ankle Functional Status Risk-Adjustment Calculation Table. Use this table if the patient has a foot or ankle impairment.

Variable	Intake			Discharge		
	Response	Beta coef.	Predicted Value	Response	Beta coef.	Predicted Value
Gender (select one)						
Male		0			0	
Female		-.05			-2.08	
Symptom Onset (select one)						
0 to 7 days		0			0	
8 to 14 days		-1.03			.73	
15 to 21 days		-3.06			-2.10	
22 to 90 days		1.81			-3.91	
91 days to 6 mos		4.88			-8.82	
over 6 mos		3.88			-7.51	
Age (enter age)		-.09			-.11	
Surgery (select one)						
0		0			0	
1 or more		-5.66			-.53	
Payer (select one)						
PPO		0			0	
Indemnity		6.65			-4.53	
Litigation		0			0	
Medicaid		-10.07			-3.40	
Medicare Part A		-3.68			5.00	
Medicare Part B		-2.13			1.69	
Patient		-6.31			.53	
HMO		-.10			3.04	
WC		-6.82			.51	
Other		-3.01			1.46	
FCI (select one)						
0		0			0	
1		-5.13			.39	
2 or 3		-3.99			1.89	
4 or more		-7.31			-2.94	
FABQ (select one)						
Low		0			0	
High		-8.02			-2.28	
Constant (constant is provided)			60.61			48.92
			Enter Intake FS Measure		.61	

Risk-Adjusted Predicted FS Measure						
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coef=coefficient. PPO=Preferred Provider Organization. HMO=Health Maintenance Organization. WC=Workers' Compensation. mos=months. FCI=Functional Comorbidity Index. FS=functional status.

FOTO Shoulder Functional Status Risk-Adjustment Calculation Table. Use this table if the patient has a shoulder impairment.

Variable	Intake			Discharge		
	Response	Beta coef.	Predicted Value	Response	Beta coef.	Predicted Value
Gender (select one)						
Male		0			0	
Female		-3.94			-.66	
Symptom Onset (select one)						
0 to 7 days		0			0	
8 to 14 days		3.27			2.08	
15 to 21 days		1.48			4.05	
22 to 90 days		3.84			-1.71	
91 days to 6 mos		6.09			-.02	
over 6 mos		5.89			-1.24	
Age (enter age)		-.10			-.14	
Surgery (select one)						
0		0			0	
1 or more		-12.67			1.55	
Payer (select one)						
PPO		0			0	
Indemnity		-2.57			-.44	
Litigation		-3.90			-5.87	
Medicaid		-6.64			0	
Medicare Part A		-1.93			3.26	
Medicare Part B		-3.33			.35	
Patient		-1.00			-.01	
HMO		1.80			2.12	
WC		-2.43			-5.09	
Other		-2.39			3.19	
FCI (select one)						
0		0			0	
1		-.37			.89	
2 or 3		-3.25			-.66	
4 or more		-3.86			-2.47	
FABQ (select one)						
Low		0			0	
High		-3.73			-.23	
Constant (constant is provided)			64.13			57.08
			Enter Intake FS Measure		.40	

Risk-Adjusted Predicted FS Measure						
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coef=coefficient. PPO=Preferred Provider Organization. HMO=Health Maintenance Organization. WC=Workers' Compensation. mos=months. FCI=Functional Comorbidity Index. FS=functional status.

FOTO Elbow/Wrist/Hand Functional Status Risk-Adjustment Calculation Table. Use this table if the patient has an elbow, wrist or hand impairment.

Variable	Intake			Discharge		
	Response	Beta coef.	Predicted Value	Response	Beta coef.	Predicted Value
Gender (select one)						
Male		0			0	
Female		-5.22			-.92	
Symptom Onset (select one)						
0 to 7 days		0			0	
8 to 14 days		-3.70			2.02	
15 to 21 days		-3.44			2.34	
22 to 90 days		-1.32			1.1	
91 days to 6 mos		.67			-1.52	
over 6 mos		1.03			-6.06	
Age (enter age)		-.10			-.12	
Surgery (select one)						
0		0			0	
1 or more		-5.18			4.62	
Payer (select one)						
PPO		0			0	
Indemnity		1.15			-1.05	
Litigation		-9.09			-5.60	
Medicaid		-1.20			1.18	
Medicare Part A		6.84			.94	
Medicare Part B		.02			1.31	
Patient		2.49			-2.41	
HMO		.620			-.07	
WC		-.63			-5.64	
Other		2.05			-2.28	
FCI (select one)						
0		0			0	
1		-3.03			-1.31	
2 or 3		-.19			-2.14	
4 or more		-3.51			-3.59	
FABQ (select one)						
Low		0			0	
High		-2.83			-.77	
Constant (constant is provided)			60.61			50.63
			Enter Intake FS Measure		.46	

Risk-Adjusted Predicted FS Measure						
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coef=coefficient. PPO=Preferred Provider Organization. HMO=Health Maintenance Organization. WC=Workers' Compensation. mos=months. FCI=Functional Comorbidity Index. FS=functional status.

FOTO Lumbar Functional Status Risk-Adjustment Calculation Table. Use this table if the patient has a lumbar impairment.

Variable	Intake			Discharge		
	Response	Beta coef.	Predicted Value	Response	Beta coef.	Predicted Value
Gender (select one)						
Male		0			0	
Female		-1.40			-.84	
Symptom Onset (select one)						
0 to 7 days		0			0	
8 to 14 days		3.72			-3.32	
15 to 21 days		5.74			-3.81	
22 to 90 days		5.86			-7.12	
91 days to 6 mos		7.29			-10.94	
over 6 mos		5.35			-11.35	
Age (enter age)		-.03			-.10	
Surgery (select one)						
0		0			0	
1 or more		-4.79			-1.24	
Payer (select one)						
PPO		0			0	
Indemnity		-.09			-.52	
Litigation		-10.24			-.48	
Medicaid		-4.37			-1.82	
Medicare Part A		-.29			-2.20	
Medicare Part B		-.26			-1.06	
Patient		.59			-3.86	
HMO		.64			-.07	
WC		-5.26			-3.17	
Other		-1.35			-1.13	
FCI (select one)						
0		0			0	
1		-1.24			1.52	
2 or 3		-2.31			.78	
4 or more		-6.79			-2.20	
FABQ (select one)						
Low		0			0	
High		-5.78			-1.99	
Constant (constant is provided)			53.96			53.22
			Enter Intake FS Measure		.56	

Risk-Adjusted Predicted FS Measure						
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coef=coefficient. PPO=Preferred Provider Organization. HMO=Health Maintenance Organization. WC=Workers' Compensation. mos=months. FCI=Functional Comorbidity Index. FS=functional status.

FOTO General Orthopedic Functional Status Risk-Adjustment Calculation Table. Use this table if the patient has a general orthopedic impairment.

Variable	Intake			Discharge		
	Response	Beta coef.	Predicted Value	Response	Beta coef.	Predicted Value
Gender (select one)						
Male		0			0	
Female		-2.65			-1.99	
Symptom Onset (select one)						
0 to 7 days		0			0	
8 to 14 days		2.98			-3.76	
15 to 21 days		2.45			-4.52	
22 to 90 days		5.61			-6.48	
91 days to 6 mos		6.45			-8.84	
over 6 mos		6.37			-9.83	
Age (enter age)		0			-.03	
Surgery (select one)						
0		0			0	
1 or more		-5.56			-6.41	
Payer (select one)						
PPO		0			0	
Indemnity		.96			1.69	
Litigation		-2.89			-4.83	
Medicaid		-2.16			2.55	
Medicare Part A		.82			-2.60	
Medicare Part B		-.70			-3.14	
Patient		-2.80			-3.37	
HMO		-.01			-2.45	
WC		-4.58			-3.41	
Other		-1.33			-1.87	
FCI (select one)						
0		0			0	
1		-1.15			2.38	
2 or 3		-1.74			1.09	
4 or more		-5.18			-1.71	
FABQ (select one)						
Low		0			0	
High		-5.99			-2.53	
Constant (constant is provided)			52.96			46.03
			Enter Intake FS Measure		.66	

Risk-Adjusted Predicted FS Measure						
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coef=coefficient. PPO=Preferred Provider Organization. HMO=Health Maintenance Organization. WC=Workers' Compensation. mos=months. FCI=Functional Comorbidity Index. FS=functional status.

Patient Example:

Suppose a patient with a shoulder impairment comes to a clinic for treatment designed to improve his/her functional status deficit. Follow the steps to collect the data and risk adjust the intake then discharge functional status measures.

1. Identify the short form survey that is appropriate for the patient, in this case, patients with shoulder impairments, and have the patient complete the shoulder short form.
2. The patient (or proxy) completes the shoulder self-report survey (see below where the shoulder survey has been completed). Identify the survey as either an intake or discharge survey.
3. A staff member sums the patient's intake responses to each short form survey question.
4. A staff member collects data for all risk-adjustment variables and enters the data on the appropriate Risk-Adjustment Calculation Table.
5. A staff member finds the summed score (27) on the short form scoring algorithm table and identifies the Intake FS measure (46) to the right of the summed score.
6. A staff member uses the value for each risk-adjustment variable in the 'Response' column in the Risk-Adjustment Calculation Table for an intake measure.
7. Determine the 'Predicted Value' at intake. For variables where the patient selects one category response, like male gender, place the beta coefficient in the 'Predicted Value' column. For example, our patient is female, so the beta coefficient at intake for gender is -3.94 (pay attention to the sign before the beta coefficient!). For age, multiply the patient's age (42 years) by the beta coefficient (-0.10), and enter the product (-4.20) as the 'Predicted Value'. Place -4.20 in the 'Predicted Value' box for age.
8. To calculate the risk-adjusted Intake FS measure, add the 'Predicted Value' for each variable plus the constant. There should be only one 'Predicted Value' per variable. In this case, add $-3.94 + 3.84 - 4.20 + 0 - 2.43 - 3.25 - 3.73 + 64.13$ to get a risk-adjusted Intake FS Measures of 50.42.
9. To calculate a risk-adjusted residual Intake FS score, subtract the Risk-Adjusted FS Measure (50.42) from the unadjusted FS Measure (46) from to get -4.42.
10. Repeat the process to get the unadjusted Discharge FS Measure (63), risk-adjusted Discharge FS Measure (61.25), and risk-adjusted residual Discharge FS score (1.75).
11. Remember that the constants are added to the 'Predicted Values' to get the Intake FS Measure and Discharge FS Measure. And you will need to multiply the patient's age by the age beta coefficient to get the 'Predicted Value' for age at Intake and Discharge (they are different!). Also, use the unadjusted Intake FS Measure for the risk-adjusted Discharge FS Measure calculations.

Example: Shoulder Intake FS Measure Short Form

INTAKE: FOTO Shoulder 10-Item Paper Short Form completed by the patient or a proxy.

Activities	I Can't Do This	Much Difficulty	Some Difficulty	Little Difficulty	No Difficulty
Comb or brush your hair using your affected arm			3		
Use your affected arm to place a can of soup (1 lb) on a shelf at shoulder height			3		
Use your affected arm to pick up and drink out of a full water glass			3		
Use your affected arm to reach a shelf that is shoulder height	1				
Use your affected arm to reach an overhead shelf	1				
Push yourself out of a chair using both arms				4	
While sitting, reach across to the middle of a table with your affected arm to get a salt shaker				4	
Get a scarf or necktie over your head and around your neck, using both hands		2			
Put deodorant under the arm opposite your affected shoulder using your affected arm			3		
Pull a chair out from a table, using your affected arm			3		

INTAKE Sum=27 (1+1+2+3+3+3+3+3+4+4=27)

The patient answered all items, so using the FOTO Shoulder 10-Item Paper Short Form Scoring Algorithm, find the number '27' in the left 'Sum' column. Select the FS Measure that corresponds to the sum of '27' or 46. So the patient's unadjusted INTAKE FS measure is 46.

Sum	FS Measure
10	0
11	14
12	20
13	24
14	26
15	29
16	30
17	32
18	34
19	35
20	37
21	38
22	40
23	41

24	42
25	44
26	45
27	46
28	48
29	49
30	50
31	51
32	53
33	54
34	55
35	56
36	58
37	59
38	60
39	62
40	63
41	64
42	66
43	67
44	69
45	71
46	73
47	76
48	79
49	85
50	100

To risk adjust the patient's Intake FS Measure of 46, use the FOTO Shoulder Functional Status Risk-Adjustment Calculation Table. Enter patient demographic data in the 'Response' column for 'Intake', and place the proper corresponding value in the 'Predicted Value' column.

Variable	Intake			Discharge		
	Response	Beta coef.	Predicted Value	Response	Beta coef.	Predicted Value
Gender (select one)						
Male		0			0	
Female	X	-3.94	-3.94		-.66	
Symptom Onset (select one)						
0 to 7 days		0			0	
8 to 14 days		3.27			2.08	
15 to 21 days		1.48			4.05	
22 to 90 days	X	3.84	3.84		-1.71	
91 days to 6 mos		6.09			-.02	
over 6 mos		5.89			-1.24	
Age (enter age)	42	-.10	-4.20		-.14	
Surgery (select one)						
0	X	0	0		0	
1 or more		-12.67			1.55	
Payer (select one)						
PPO		0			0	
Indemnity		-2.57			-.44	
Litigation		-3.90			-5.87	
Medicaid		-6.64			0	
Medicare Part A		-1.93			3.26	
Medicare Part B		-3.33			.35	
Patient		-1.00			-.01	
HMO		1.80			2.12	
WC	X	-2.43	-2.43		-5.09	
Other		-2.39			3.19	
FCI (select one)						
0		0			0	
1		-.37			.89	
2 or 3	X	-3.25	-3.25		-.66	
4 or more		-3.86			-2.47	
FABQ (select one)						
Low		0			0	
High	X	-3.73	-3.73		-.23	

Constant (constant is provided)			64.13			57.08
			Enter Intake FS Measure		.40	
Risk-Adjusted Predicted FS Measure			50.42			

coef=coefficient. PPO=Preferred Provider Organization. HMO=Health Maintenance Organization. WC=Workers' Compensation. mos=months. FCI=Functional Comorbidity Index. FS=functional status.

Remember to add the constant. And remember to multiply the patient's age by the age beta coefficient.

So the raw unadjusted Intake FS Measure was 46, but given the risk-adjustment variables for this patient, we would have predicted her Intake FS Measure to be 50.42. That provides a risk-adjusted residual score for the Intake FS Measure of -4.42 ($46 - 50.42 = -4.42$).

Now our example patient progresses through treatment and is ready for discharge. She completes the discharge shoulder FS short form.

DISCHARGE: FOTO Shoulder 10-Item Paper Short Form completed by the patient or a proxy.

Activities	I Can't Do This	Much Difficulty	Some Difficulty	Little Difficulty	No Difficulty
Comb or brush your hair using your affected arm				4	
Use your affected arm to place a can of soup (1 lb) on a shelf at shoulder height				4	
Use your affected arm to pick up and drink out of a full water glass					5
Use your affected arm to reach a shelf that is shoulder height			3		
Use your affected arm to reach an overhead shelf			3		
Push yourself out of a chair using both arms				4	
While sitting, reach across to the middle of a table with your affected arm to get a salt shaker					5
Get a scarf or necktie over your head and around your neck, using both hands				4	
Put deodorant under the arm opposite your affected shoulder using your affected arm				4	
Pull a chair out from a table, using your affected arm				4	

DISCHARGE Sum=40 (3+3+4+4+4+4+4+4+5+5)

The patient answered all items, so using the FOTO Shoulder 10-Item Paper Short Form Scoring Algorithm, find the number '40' in the left 'Sum' column. Select the FS Measure that corresponds to the sum of '40' or 63. So the patient's unadjusted DISCHARGE FS measure is 63.

Sum	FS Measure
10	0
11	14
12	20
13	24
14	26
15	29
16	30
17	32
18	34
19	35
20	37
21	38

22	40
23	41
24	42
25	44
26	45
27	46
28	48
29	49
30	50
31	51
32	53
33	54
34	55
35	56
36	58
37	59
38	60
39	62
40	63
41	64
42	66
43	67
44	69
45	71
46	73
47	76
48	79
49	85
50	100

To risk adjust the patient's Discharge FS Measure of 63, use the FOTO Shoulder Functional Status Risk-Adjustment Calculation Table. Enter patient demographic data in the 'Response' column for 'Discharge', and place the proper corresponding value in the 'Predicted Value' column at 'Discharge'. The Intake data were left in the table for comparison.

Variable	Intake			Discharge		
	Response	Beta coef.	Predicted Value	Response	Beta coef.	Predicted Value
Gender (select one)						
Male		0			0	
Female	X	-3.94	-3.94		-.66	-.66
Symptom Onset (select one)						
0 to 7 days		0			0	
8 to 14 days		3.27			2.08	
15 to 21 days		1.48			4.05	
22 to 90 days	X	3.84	3.84		-1.71	-1.71
91 days to 6 mos		6.09			-.02	
over 6 mos		5.89			-1.24	
Age (enter age)	42	-.10	-4.20		-.14	-5.88
Surgery (select one)						
0	X	0	0		0	0
1 or more		-12.67			1.55	
Payer (select one)						
PPO		0			0	
Indemnity		-2.57			-.44	
Litigation		-3.90			-5.87	
Medicaid		-6.64			0	
Medicare Part A		-1.93			3.26	
Medicare Part B		-3.33			.35	
Patient		-1.00			-.01	
HMO		1.80			2.12	
WC	X	-2.43	-2.43		-5.09	-5.09
Other		-2.39			3.19	
FCI (select one)						
0		0			0	
1		-.37			.89	
2 or 3	X	-3.25	-3.25		-.66	-.66
4 or more		-3.86			-2.47	
FABQ (select one)						
Low		0			0	
High	X	-3.73	-3.73		-.23	-.23

Constant (constant is provided)			64.13			57.08
			Enter Intake FS Measure	46	.40	18.4
Risk-Adjusted Predicted FS Measure			50.42			61.25

coef=coefficient. PPO=Preferred Provider Organization. HMO=Health Maintenance Organization. WC=Workers' Compensation. mos=months. FCI=Functional Comorbidity Index. FS=functional status.

Remember to:

- 1. Add the constant**
- 2. Multiply the patient's age by the age beta coefficient**
- 3. Add the Intake FS Measures from the Shoulder Short Form conversion table (NOT the risk-adjusted Intake FS Measure!) and multiply by the Intake FS Measure beta coefficient.**

So the raw unadjusted Discharge FS Measure was 63, but given the risk-adjustment variables for this patient, we would have predicted her Discharge FS Measure to be 61.25. That provides a risk-adjusted residual score for the Discharge FS Measure of 1.75.

Clinician-Level Risk Adjustment:

To perform clinician-level risk adjustment, simply sum the risk-adjusted residual Discharge scores from each patient the clinician treated over a period of time, like the past 12 months, and divide by the number of patients treated over that 12 month period. The result will be the average risk-adjusted Discharge residual score for the clinician, which can be compared across clinicians for a specific type of patient.