Expanded Home Health Value-Based Purchasing (HHVBP) Model Technical Specifications for the Total Normalized Composite (TNC) Change Measures: April 2023

Last updated: April 28, 2023

I. Background

The Centers for Medicare & Medicaid Services (CMS) maintains, re-evaluates, and implements changes to the OASIS data item set and develops, implements, maintains, and re-evaluates quality measures that are reflective of quality of care provided by home health agencies (HHAs) in the home setting. For OASIS-based home health outcome measures, the re-evaluation process includes evaluating and updating, as needed, the risk adjustment models used to adjust for patient characteristics at start of care (SOC) or resumption of care (ROC), to ensure they are adequately robust and allow for valid comparison across providers. OASIS-based home health outcome measures are risk adjusted using OASIS items that are statistically significant and clinically relevant predictors of the outcome.

The updated risk adjustment models for the expanded Home Health Value-Based Purchasing (HHVBP) Model composite change measures, Total Normalized Composite (TNC) Change in Mobility and TNC Change in Self-Care, re-produce the prior risk adjustment models after revising the following risk factors to accommodate changes in OASIS-E. This update aligns with the update to the risk adjustment models made for OASIS-based outcome measures under the Home Health Quality Reporting Program.

- Depression Screening (PHQ-2 Score) was replaced with Patient Mood Screening (PHQ-2 to 9).
- Home Care Diagnoses were replaced with CMS-Hierarchical Condition Categories (CMS-HCCs).

Section II details the technical steps for calculating each home health agency-level observed TNC Change measures. Section III displays the updated risk factor coefficients. The potential risk factor specifications used in the risk adjustment models and the risk adjustment formula for risk-adjusting the composite outcome measures align with those used for the OASIS-based outcome measures under the Home Health Quality Reporting Program and are therefore not further discussed in this document. Please refer to Risk Adjustment Technical Steps and Risk Factor Specifications and HHQRP Measure Calculations and Reporting User' Manual – Version 2.0 (under Downloads) for additional relevant details.

This risk adjustment update is applicable to home health quality episodes with SOC or ROC dates on or after January 1, 2023.

For a list of risk factor coefficients applicable to episodes that began prior to January 1, 2023, please refer to the *Technical Specifications for the Total Normalized Composite (TNC) Change Measures: October 2021* available on the Expanded HHVBP Model webpage under *Quality Measures*.

II. Technical Specifications

Table 1. Total Normalized Composite (TNC) Change in Mobility

Measure Description

This functional outcome measure captures the change in home health patients' mobility between start or resumption of care (SOC/ROC) and the end of care (EOC). It is a composite of three OASIS items related to mobility (i.e., M1840, M1850, and M1860).

Measure Specifications

The Total Normalized Composite Change in Mobility (TNC Change in Mobility) is calculated from the observed difference in patient mobility between SOC/ROC (designated as [1]) and the EOC (designated as [2]) in eligible home health quality episodes ending with a discharge from the agency during the reporting period (M0100[2] = 09), except for those meeting the exclusion criteria.

Measure Computational Steps

Episode Level

1) Compute the raw change for each applicable OASIS item:

M1840 Raw Change = M1840[1] - M1840[2]

M1850 Raw Change = M1850[1] - M1850[2]

M1860 Raw Change = M1860[1] - M1860[2]

2) Compute the normalized change for each applicable OASIS item:

M1840 Normalized Change = M1840 Raw Change / M1840 Maximum Change Value(4)

M1850 Normalized Change = M1850 Raw Change / M1850 Maximum Change Value(5)

M1860 Normalized Change = M1860 Raw Change / M1860 Maximum Change Value(6)

3) Sum the normalized change for all applicable OASIS items:

Sum Normalized Change in Mobility = M1840 Normalized Change + M1850 Normalized Change + M1860 Normalized Change

Agency Level

4) Sum the Sum Normalized Change in Mobility for all eligible home health quality episodes and divide by the total number of eligible home health quality episodes:

TNC Change in Mobility = sum of Sum Normalized Change Mobility / Agency total number of eligible home health quality episodes

Episode Exclusions

Home health quality episodes for which the patient was nonresponsive at SOC/ROC: M1700[1] = 04, or M1710[1] = NA, or M1720[1] = NA or was discharged to a non-institutional hospice (M2420[2] = 03) at the EOC M0100[2] = 09).

OASIS Items Used

(M0100) Reason for Assessment

(M1700) Cognitive Functioning

(M1710) When Confused

(M1720) When Anxious

(M2420) Discharge Disposition

Covariates

See the Risk Adjustment Technical Specifications in Section III below.

Table 2. Total Normalized Composite (TNC) Change in Self-Care

Measure Description

This functional outcome measure captures the change in home health patients' self-care between start or resumption of care (SOC/ROC) and the end of care (EOC). It is a composite of six OASIS items related to self-care (i.e., M1800, M1810, M1820, M1830, M1845, and M1870).

Measure Specifications

The Total Normalized Composite Change in Self-Care (TNC Change in Self-Care) is calculated from the observed difference in patient self-care between SOC/ROC (designated as [1]) and EOC (designated as [2]) in home health quality episodes ending with a discharge from the agency during the reporting period (M0100[2] = 09), except for those meeting the exclusion criteria.

Measure Computations

Episode Level

1) Compute the raw change for each applicable OASIS item:

2) Compute the normalized change for each applicable OASIS item:

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M1800 Normalized Change = M1800 Raw Change / M1800 Maximum Change Value(3)
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M1810 Normalized Change = M1810 Raw Change / M1810 Maximum Change Value(3)

M1820 Normalized Change = M1820 Raw Change / M1820 Maximum Change Value(3)

M1830 Normalized Change = M1830 Raw Change / M1830 Maximum Change Value(6)

M1845 Normalized Change = M1845 Raw Change / M1845 Maximum Change Value(3)

M1870 Normalized Change = M1870 Raw Change / M1870 Maximum Change Value(5)

3) Sum the normalized change for all applicable OASIS items:

Sum Normalized Change in Self Care = M1800 Normalized Change + M1810 Normalized Change + M1820 Normalized Change + M1830 Normalized Change + M1845 Normalized Change + M1870 Normalized Change

Agency Level

4) Sum the Sum Normalized Change in Self-Care for all eligible home health quality episodes and divide by the number of total eligible home health quality episodes:

TNC Change in Self-Care = sum of Sum Normalized Change in Self-Care / Agency total number of eligible home health quality episodes

Episode Exclusions

Home health quality episodes for which the patient was nonresponsive at SOC/ROC: M1700[1] = 04, or M1710[1] = NA, or M1720[1] = NA or was discharged to a non-institutional hospice (M2420[2] = 03) at the EOC M0100[2] = 09).

OASIS Items Used

(M0100) Reason for Assessment (M1820) Dressing Lower Body

(M1700) Cognitive Functioning (M1830) Bathing

(M1710) When Confused (M1845) Toilet Hygiene

(M1720) When Anxious (M1870) Eating

(M1800) Grooming (M2420) Discharge Disposition

(M1810) Dressing Upper Body

Covariates

See the Risk Adjustment Technical Specifications in Section III below.

III. Risk Factors, Covariates, and Estimated Coefficients

Recalibrated models, effective CY 2023

Risk	Diek Feeten	Variable Name	Excluded	TNC Chang	e in Mobility	TNC Change	in Self Care
Factor #	Risk Factor	variable Name	Category Indicator	Covariate	Coefficient	Covariate	Coefficient
		AGE_0_54		1	-0.0059	1	-0.0474
		AGE_55_59		2	-0.0123	2	-0.0389
		AGE_60_64		3	-0.0187	3	-0.0478
		AGE_65_69	Excluded category				
1	٨٥٥	AGE_70_74		4	-0.0028	4	0.0014
l I	Age	AGE_75_79		5	-0.0160	5	-0.0265
		AGE_80_84		6	-0.0362	6	-0.0732
		AGE_85_89		7	-0.0662	7	-0.1422
		AGE_90_94		8	-0.1065	8	-0.2561
		AGE_95PLUS		9	-0.1594	9	-0.4236
2	0 1	GENDER_FEMALE	Excluded category				
2	Gender	GENDER_MALE		10	0.0189	10	0.0111
		PAY_MCARE _FFS	Excluded category				
		PAY_MCARE_HMO		11	-0.0116	11	-0.0115
3	Payment source	PAY_MCAREANDMCAID		12	-0.0705	12	-0.1777
	Course	PAY_MCAID_ONLY		13	-0.0164	13	-0.0454
		PAY_OTHER_COMBO		14	0.0080	14	0.0502
	SOC/ROC and	SOC_INPT	Excluded category				
4	Admission	SOC_COMM		15	-0.0848	15	-0.2057
	Source	ROC		16	-0.0893	16	-0.2244

Risk	Diele Feeten	Variable Name	Excluded	TNC Chang	je in Mobility	TNC Change	in Self Care
Factor #	Risk Factor	Variable Name	Category Indicator	Covariate	Coefficient	Covariate	Coefficient
5	Post-acute facility	INPT_POSTACUTE		17	-0.0451	17	-0.0516
5	admission source	INPT_NOPOSTACUTE	Excluded category				
		RISK_HSTRY_FALLS					
6	Risk of Hospitalization	RISK_WEIGHTLOSS		18	0.0193	18	0.0338
		RISK_MLTPL_HOSPZTN		19	-0.0160	19	-0.0371
		RISK_ED		20	0.0072	20	0.0185
		RISK_RCNT_DCLN		21	0.0240	21	0.0467
	Risk of Hospitalization	RISK_COMPLY		22	0.0093	22	0.0242
6		RISK_5PLUS_MDCTN					
		RISK_EXHAUST		23	0.0140	23	0.0385
		RISK_OTHR					
		RISK_NONE		24	0.0321	24	0.0483
		ASSIST_ARND_CLOCK		25	-0.0336	25	-0.1106
		ASSIST_REGDAY		26	-0.0461	26	-0.1510
		ASSIST_REGNITE		27	-0.0069	27	-0.0267
7	Availability of Assistance	ASSIST_OCC_NONE	Excluded category				
	, toolotanoo	LIV_ALONE		28	0.0277	28	0.1148
		LIV_OTHERS	Excluded category				
		LIV_CONGREGATE		29	-0.0439	29	-0.0842
0	Pressure	PU_NONE_STG1ONLY	Excluded category				
8	Ulcers	PU_STG2PLUS_UNSTG		30	-0.1230	30	-0.2737

Risk	Diele Feeten	Variable Name	Excluded	TNC Chang	je in Mobility	TNC Change	in Self Care
Factor #	Risk Factor	Variable Name	Category Indicator	Covariate	Coefficient	Covariate	Coefficient
		STAS_ULCR_NONE	Excluded category				
9	Stasis Ulcer	STAS_ULCR_OBS_1		31	-0.0221	31	-0.0703
		STAS_ULCR_OBS_2PLUS		32	-0.0530	32	-0.1648
		SRG_WND_OBS_NONE	Excluded category				
10	Surgical	SRG_WND_OBS_EPI		33	0.0479	33	0.1240
10	Wound	SRG_WND_OBS_GRAN		34	0.0534	34	0.1173
		SRG_WND_OBS_NOHEAL		35	0.0728	35	0.1763
		DYSP0	Excluded category				
11	Dyspnea	DYSP1		36	0.0452	36	0.1044
11		DYSP2		37	0.0293	37	0.0598
		DYSP34		38	0.0626	38	0.1153
	Urinary Status	URINCONT_NONE	Excluded category				
12		URINCONT_INCONT		39	-0.0627	39	-0.1551
		URINCONT_CATH		40	-0.1185	40	-0.2769
		BWL_NONE_UK	Excluded category				
		BWL_FR1		41	-0.0365	41	-0.1042
13	Bowel Incontinence	BWL_FR2		42	-0.0928	42	-0.2408
		BWL_FR345		43	-0.2162	43	-0.4746
		BWL_OSTOMY		44	-0.0466	44	-0.1190
		COGN0	Excluded category				
14	Cognitive	COGN1		45	-0.0325	45	-0.1025
14	function	COGN2		46	-0.0477	46	-0.1967
		COGN34		47	-0.0807	47	-0.3747

Risk	Diele Feeten	Variable Name	Excluded	TNC Chang	je in Mobility	TNC Change	in Self Care
Factor #	Risk Factor	Variable Name	Category Indicator	Covariate	Coefficient	Covariate	Coefficient
		CONF0	Excluded category				
15	Confusion	CONF1		48	-0.0181	48	-0.0611
15	Confusion	CONF23		49	-0.0392	49	-0.1523
		CONF4		50	-0.0792	50	-0.3578
		ANX0	Excluded category				
40	Accession	ANX1		51	-0.0009	51	-0.0063
16	Anxiety	ANX2		52	0.0111	52	0.0260
		ANX3		53	0.0428	53	0.1181
		PHQ2_TO9_NOTMEET	Excluded category				
17	Patient Mood Screening	PHQ2_TO9_MEET		54	-0.0229	54	-0.0564
		PHQ2_TO9_NA		55	-0.0456	55	-0.1760
	Behavioral Symptoms	BEHAV_NONE		56	0.0375	56	0.0822
40		BEHAV_MEM_DEFICIT				57	-0.0635
18		BEHAV_IMPR_DECISN		57	-0.0084	58	-0.0581
		BEHAV_OTHR		58	-0.0341	59	-0.1493
		BEHPFR0	Excluded category				
	Disruptive	BEHPFR12		59	0.0193	60	0.0683
19	Behavior	BEHPFR3		60	0.0234	61	0.0894
	Frequency	BEHPFR4		61	0.0302	62	0.1119
		BEHPFR5		62	0.0440	63	0.1392
		GROOM0	Excluded category				
20	One e!	GROOM1		63	0.0025	64	0.2751
20	Grooming	GROOM2		64	-0.0140	65	0.5085
		GROOM3		65	-0.0625	66	0.6097

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Risk	Diele Franken	Wastalila Nassa	Excluded	TNC Chang	e in Mobility	TNC Change	in Self Care
Factor #	Risk Factor	Variable Name	Category Indicator	Covariate	Coefficient	Covariate	Coefficient
		UPPER0	Excluded category				
21	Upper Body	UPPER1				67	0.2729
21	Dressing	UPPER2				68	0.4811
		UPPER3				69	0.6859
		LOWER0	Excluded category				
00	Lower Body	LOWER1		66	0.0144	70	0.2756
22	Dressing	LOWER2		67	-0.0175	71	0.5256
		LOWER3		68	-0.0270	72	0.7930
		ватно	Excluded category				
	Bathing	BATH1		69	-0.0164	73	0.1344
		BATH2		70	0.0023	74	0.2830
23		ватнз		71	-0.0136	75	0.3806
		BATH4		72	-0.0159	76	0.5519
		BATH5		73	-0.0028	77	0.7100
		BATH6		74	-0.1223	78	0.4617
		TLTTRN0	Excluded category				
24	Toilet	TLTTRN1		75	0.2322	79	0.0143
24	Transferring	TLTTRN2		76	0.4277	80	-0.0558
		TLTTRN34		77	0.8307	81	-0.0432
		TLTHYG0	Excluded category				
25	Tailet Illusier -	TLTHYG1		78	-0.0071	82	0.2731
25	Toilet Hygiene	TLTHYG2		79	-0.0334	83	0.5061
		TLTHYG3		80	-0.0745	84	0.6312

Risk	Diek Feeten	Variable Name	Excluded	TNC Chang	e in Mobility	TNC Change	in Self Care
Factor #	Risk Factor	Categor	Category Indicator	Covariate	Coefficient	Covariate	Coefficient
		TRNFR0	Excluded category				
26	Transferring	TRNFR1		81	0.1279	85	-0.0262
20	rransieming	TRNFR2		82	0.2820	86	0.0044
		TRNFR345		83	0.3962	87	-0.0798
		AMB0	Excluded category				
		AMB1		84	0.1334	88	0.0135
27	Ambulation	AMB2		85	0.1999	89	-0.0497
		AMB3		86	0.3669	90	0.0693
		AMB456		87	0.2948	91	-0.4724
	Feeding or Eating	EAT0	Excluded category				
28		EAT1		88	-0.0124	92	0.1082
20		EAT2		89	-0.0535	93	0.1220
		EAT345		90	-0.1236	94	0.0908
		ORMED0	Excluded category				
29	Oral	ORMED1		91	0.0203	95	0.0313
29	Medication Management	ORMED2		92	0.0281	96	0.0377
		ORMED3		93	0.0524	97	0.0795
		SPRVSN_NONE_NEEDED	Excluded category				
20	Supervision	SPRVSN_CG_PROVIDES		94	-0.0244	98	-0.0796
30	and Safety Assistance	SPRVSN_NEED_TRAINING		95	-0.0065	99	-0.0253
		SPRVSN_CG_UNCERTAIN_NONE		96	-0.0057	100	-0.0148

Risk	Diala Fastan	Vorishie News	TNC Chang	e in Mobility	TNC Change in Self Care	
Factor #	Risk Factor	Variable Name	Covariate	Coefficient	Covariate	Coefficient
		HCC1 - HIV/AIDS				
		HCC2 - Septicemia, Sepsis, SIRS/Shock				
		HCC6 - Opportunistic Infections				
		HCC8 - Metastatic Cancer and Acute Leukemia	97	-0.1149	101	-0.3387
		HCC9 - Lung and Other Severe Cancers	98	-0.0377	102	-0.1517
		HCC10 - Lymphoma and Other Cancers	99	-0.0306	103	-0.1047
		HCC11 - Colorectal, Bladder, and Other Cancers	100	0.0315		
		HCC12 - Breast, Prostate, and Other Cancers and Tumors	101	0.0126		
		HCC17 - Diabetes with Acute Complications				
	Hierarchical Condition	HCC18 - Diabetes with Chronic Complications	102	-0.0327	104	-0.0749
		HCC19 - Diabetes without Complication	103	-0.0091	105	-0.0297
		HCC21 - Protein-Calorie Malnutrition	104	-0.0219	106	-0.0850
31		HCC22 - Morbid Obesity	105	-0.0590	107	-0.1008
	Categories	HCC23 - Other Significant Endocrine and Metabolic Disorders				
		HCC27 - End-Stage Liver Disease	106	-0.0332	108	-0.1067
		HCC28 - Cirrhosis of Liver	107	-0.0306	109	-0.0834
		HCC29 - Chronic Hepatitis				
		HCC33 - Intestinal Obstruction/Perforation	108	0.0234		
		HCC34 - Chronic Pancreatitis				
		HCC35 - Inflammatory Bowel Disease	109	0.0343	110	0.0752
		HCC39 - Bone/Joint/Muscle Infections/Necrosis			111	-0.0292
		HCC40 - RA and Inflammatory Connective Tissue Disease	110	-0.0154	112	-0.0246
		HCC46 - Severe Hematological Disorders	111	-0.0296	113	-0.0829
		HCC47 - Disorders of Immunity				
į		HCC48 - Coagulation and Other Hematological Disorders				

Risk	Diele Feeten	Wastalita Nama	TNC Chang	e in Mobility	TNC Change in Self Care	
Factor #	Risk Factor	Variable Name	Covariate	Coefficient	Covariate	Coefficient
		HCC51 - Dementia With Complications	112	-0.0662	114	-0.3106
		HCC52 - Dementia Without Complication	113	-0.0504	115	-0.2377
		HCC54 - Substance Use with Psychotic Complications				
		HCC55 - Substance Use Disorder, Moderate/Severe				
		HCC56 - Substance Use Disorder, Mild				
		HCC57 - Schizophrenia				
		HCC58 - Reactive and Unspecified Psychosis				
		HCC59 - Major Depressive, Bipolar, and Paranoid Disorders	114	-0.0140	116	-0.0432
		HCC60 - Personality Disorders				
		HCC70 - Quadriplegia	115	-0.4647	117	-0.9039
	Hierarchical Condition	HCC71 - Paraplegia	116	-0.3396	118	-0.3210
		HCC72 - Spinal Cord Disorders/Injuries	117	-0.1115	119	-0.1644
31		HCC73 - ALS and Other Motor Neuron Disease	118	-0.4361	120	-1.1787
	Categories	HCC74 - Cerebral Palsy	119	-0.2768	121	-0.5938
		HCC75 - Myoneural Disorders and Guillain-Barre Syndrome	120	-0.0377	122	-0.0504
		HCC76 - Muscular Dystrophy	121	-0.2986	123	-0.5277
		HCC77 - Multiple Sclerosis	122	-0.1843	124	-0.2863
		HCC78 - Parkinson's and Huntington's Diseases	123	-0.1029	125	-0.3062
		HCC79 - Seizure Disorders and Convulsions	124	-0.0336	126	-0.1092
		HCC80 - Coma, Brain Compression/Anoxic Damage	125	-0.0432	127	-0.1246
		HCC82 - Respirator Dependence/Tracheostomy Status	126	-0.0377	128	-0.1797
		HCC83 - Respiratory Arrest				
		HCC84 - Cardio-Respiratory Failure and Shock			129	-0.0262
		HCC85 - Congestive Heart Failure	127	-0.0411	130	-0.1023
		HCC86 - Acute Myocardial Infarction	128	0.0231	131	0.0218

Risk	Diale Footon	Verifolds Norma	TNC Chang	e in Mobility	TNC Change	in Self Care
Factor #	Risk Factor	Variable Name	Covariate	Coefficient	Covariate	Coefficient
		HCC87 - Acute Ischemic Heart Disease	129	0.0212		
		HCC88 - Angina Pectoris				
		HCC96 - Specified Heart Arrhythmias				
		HCC99 - Intracranial Hemorrhage				
		HCC100 - Ischemic or Unspecified Stroke	130	-0.0691	132	-0.1773
		HCC103 - Hemiplegia/Hemiparesis	131	-0.1015	133	-0.2777
		HCC104 - Monoplegia, Other Paralytic Syndromes	132	-0.0439	134	-0.0921
		HCC106 - Atherosclerosis of the Extremities	133	-0.1069	135	-0.2407
		HCC107 - Vascular Disease with Complications				
	Hierarchical Condition Categories	HCC108 - Vascular Disease	134	-0.0191	136	-0.0324
		HCC110 - Cystic Fibrosis				
		HCC111 - Chronic Obstructive Pulmonary Disease	135	-0.0296	137	-0.0737
31		HCC112 - Fibrosis of Lung and Other Chronic Lung Disorders	136	-0.0182	138	-0.0587
	Categories	HCC114 - Aspiration and Specified Bacterial Pneumonias	137	-0.0244	139	-0.0987
		HCC115 - Pneumococcal Pneumonia, Empyema, Lung Abscess				
		HCC122 - Proliferative Diabetic Retinopathy				
		HCC124 - Exudative Macular Degeneration				
		HCC134 - Dialysis Status	138	-0.1357	140	-0.3422
		HCC135 - Acute Renal Failure				
		HCC136 - Chronic Kidney Disease, Stage 5	139	-0.0956	141	-0.2366
		HCC137 - Chronic Kidney Disease, Severe (Stage 4)	140	-0.0208	142	-0.0521
		HCC138 - Chronic Kidney Disease, Moderate (Stage 3)				
		HCC157 - Pressure Ulcer of Skin with Necrosis	141	-0.2287	143	-0.3647
		HCC158 - Pressure Ulcer of Skin with Full Skin Loss	142	-0.0887	144	-0.1781

Risk	Diek Feeten	Variable Name	TNC Chang	e in Mobility	TNC Change in Self Care	
Factor #	Risk Factor	Variable Name	Covariate	Coefficient	Covariate	Coefficient
		HCC159 - Pressure Ulcer of Skin with Partial Skin Loss	143	-0.0432	145	-0.1004
		HCC161 - Chronic Ulcer of Skin, Except Pressure	144	-0.0583	146	-0.1660
		HCC162 - Severe Skin Burn or Condition				
		HCC166 - Severe Head Injury				
		HCC167 - Major Head Injury				
24	Hierarchical Condition Categories	HCC169 - Vertebral Fractures without Spinal Cord Injury				
31		HCC170 - Hip Fracture/Dislocation				
		HCC173 - Traumatic Amputations and Complications				
		HCC176 - Complications of Implanted Device or Graft	145	-0.0175		
		HCC186 - Major Organ Transplant Status	146	0.0362		
		HCC188 - Artificial Openings for Feeding or Elimination	147	0.0219		
		HCC189 - Amputation Status, LL Amputation Complications	148	-0.1361	147	-0.1084
_CONS		CONSTANT	149	0.0395	148	0.1991