ABCs of HHS-HCCs: Taking a Closer Look at the Commercial Risk Adjustment

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There are three age-defined models under commercial risk adjustment. These are the Adult Model (ages 21 and up), the Child Model (ages 2–21), and the Infant Model (ages 0–1). The model applicable to a patient is dependent on their age at the end of the benefit year. If a 20-year-old patient turns 21 on December 31, the patient will be in the Adult Model for that year. There is one exception to this rule. Any infant born at the end of one benefit year and discharged in the second benefit year is considered age 0 for both years.

The Department of Health and Human Services' Hierarchical Condiction Categories (HHS-HCCs) that feed these models are specific diagnosis codes used to report conditions addressed by the provider in a face-to-face encounter with the patient. If a diagnosis code reported for a patient maps to an HCC, then the coefficient (or weight) of that HCC is added to the patient's risk score. If a particular code is reported multiple times, it will only be counted once. If multiple different codes mapping to the same HCC are reported, the HCC will only be counted once.

While many HCCs are additive, if a particular HCC falls within a hierarchy, and more than one unique HCC within that hierarchy is reported, the patient's risk score is only impacted by the highest weighted HCC in the hierarchy. If a patient has two or more HCCs that fall into two different hierarchies, then the highest weighted HCCs in each hierarchy are additive. An example of a hierarchy under HHS-HCCs is displayed in the table on this page. If a diagnosis mapping to HCC 090, Personality Disorders, is assigned during the year in addition to a diagnosis mapping to HCC 087, Schizophrenia, the patient's risk score will only be impacted by HHS-HCC 087.

HHS-HCC Hierarchy Example

HCC	Supersedes HCCs	HCC Description
087	088, 089, 090, 102, 103	Schizophrenia
088	089, 090, 102, 103	Major Depressive and Bipolar Disorders
089	090, 102, 103	Reactive and Unspecified Psychosis, Delusional Disorders
090		Personality Disorders
102	090, 103	Autistic Disorder
103	090	Pervasive Developmental Disorders, Except Autistic Disorder

Demographic Factors Affect Group Assignment

In addition to hierarchies, the commercial risk adjustment model utilizes groups. When one or more codes mapping to multiple HCCs in the same group are reported, only a single group weight will be added to the risk score.

While HCC assignment is driven by diagnosis code, demographic factors such as age and sex can further impact assignment. The table at the top of page 77 displays a few examples.

Some HCCs are specific to only one or two models while other HCCs cross all models. The pregnancy HCCs are applicable to both the Child and Adult Models but are further limited by sex and age at the time of the diagnosis (ages 12–55). Patients who are not within this age range will not be assigned a pregnancy HCC. HCCs driven by low birth weight diagnoses are restricted to the Infant Model, age 0.

Demographic Factors Impacting HCC Assignment

Coded Conditions	Demographic	HHS-HCC	Demographic	HHS-HCC
Breast Cancer	Age <50	011, Colorectal, Breast (Age < 50), Kidney, and Other Cancers	Age 50+	012, Breast (Age 50+) and Prostate Cancer, Benign/Uncertain Brain Tumors, and Other Cancers and Tumors
Conjoined Twins	Age 0	247, Premature Newborns, Including Birth weight 2000-2499 Grams	Age 1+	097, Down Syndrome, Fragile X, Other Chromosomal Anomalies, and Congenital Malformation Syndromes
Coagulation Factor VIII and IX Disorders	Male	066, Hemophilia	Female	075, Coagulation Defects and Other Specified Hematological Disorders

Interaction Type, Level Helps Determine Risk Score

One additional available element used in determining the risk score for a patient in the Adult Model is referred to as Interaction Type. There are two levels of interactions, medium cost and high cost. Only one interaction may be assigned to a patient, and a high cost interaction supersedes a medium cost interaction. The two variables used in determining an interaction level and coefficient are severe illness indicator and the interaction factor (desiginated HCCs or HCC groups). Based on the combination of the two variables, there are nine possible high cost interactions and seven possible medium cost interactions.

Severe illness indicators include:

- 002 Septicemia, Sepsis, Systemic Inflammatory Response Syndrome/Shock
- 042 Peritonitis/Gastrointestinal Perforation/Necrotizing Enterocolitis
- 120 Seizure Disorders and Convulsions
- 122 Non-Traumatic Coma, Brain Compression/Anoxic Damage
- 125 Respirator Dependence/Tracheostomy Status

- 126 Respiratory Arrest
- 127 Cardio-Respiratory Failure and Shock, Including Respiratory Distress Syndromes
- 156 Pulmonary Embolism and Deep Vein Thrombosis

Examples of HHC-HCCs Included in Infant Severity Levels

Severity Level	Examples of HHS-HCCs Included
Severity Level 5	008 Metastatic Cancer
Severity Level 5	129 Heart Transplant
Severity Level 4	126 Respiratory Arrest
Severity Level 4	145 Intracranial Hemorrhage
Severity Level 3	001 HIV/AIDS
Severity Level 3	020 Diabetes with Chronic Complications
Severity Level 2	070 Sickle Cell Anemia
Severity Level 2	081 Drug Psychosis
Severity Level 1	037 Chronic Hepatitis
Severity Level 1	0071 Thalassemia Major

Infant Model Coefficient Based on Severity Level

The Infant Model works differently than the Adult and Child Models. While infants are assigned HCCs, their coefficient is based on the highest of one of five severity levels (with one being the lowest) that result from a combination of their maturity category (birth weight or age 1) and the severity of their non-maturity HCCs.

There is also an additional coefficient added to the score of male infants based on age 0 or 1.

Adult Interactions

A severe illness indicator must be paired with a qualified HHS-HCC in order for an interaction (either high cost or medium cost) to be assigned to the patient.

High Cost Interactions	**Medium Cost Interactions**
Severe Illness Indicator with One of the Following HCCs	**Severe Illness Indicator with One of the Following HCCs**
006 Opportunistic Infections	035 End-Stage Liver Disease
008 Metastatic Cancer	038 Acute Liver Failure/Disease, Including Neonatal Hepatitis
009 Lung, Brain, and Other Severe Cancers, Including Pediatric Acute Lymphoid Leukemia	153 Atherosclerosis of the Extremities with Ulceration or Gangrene
010 Non-Hodgkin's Lymphomas and Other Cancers and Tumors	154 Vascular Disease with Complications
115 Myasthenia Gravis/Myoneural Disorders and Guillain-Barre Syndrome/Inflammatory and Toxic Neuropathy	163 Aspiration and Specified Bacterial Pneumonias and Other Severe Lung Infections
135 Heart Infection/Inflammation, Except Rheumatic	253 Artificial Openings for Feeding or Elimination
145 Intracranial Hemorrhage	HCC Group G03 054 Necrotizing Fascitis 055 Bone/Joint/Muscle Infections/Necrosis
HCC Group 6 067 Myelodysplastic Syndromes and Myelofibrosis 068 Aplastic Anemia	
HCC Group 8 073 Combined and Other Severe Immunodeficiencies 074 Disorders of the Immune Mechanism	

Source for columns 1 and 2: *The American College of Physicians' Evidence-Based Guide to Complementary & Alternative Medicine* by Bradly Jacobs, MD, MPH, and Katherine Gundling, MD, FACP. Philadelphia: ACP Press, 2009.

Patient Enrollment Plan Factors Into Risk Score

In addition to HCCs, hierarchies, groups, age/sex designations, interaction types, and infant severity levels, there is still one more element that is needed to arrive at the patient's risk score—the type of plan in which the patient is enrolled. Not only do the HHS-HCC coefficients vary by the age-defined model type (Adult, Child, or Infant), they vary between plan types.

There are five plan types, referred to as metal level plans. The five metal levels are platinum, gold, silver, bronze, and catastrophic. Under commercial risk adjustment, there are actually a total of 15 models, three age-defined models applicable to each of the five plan levels. By looking at a patient within each of the age-defined models with the same diagnoses, the impact of these variables can be seen. The table on page 79 provides an overview of these variables, organized by age group.

With many variables impacting a patient's final risk score, the foundation for the HHS Risk Adjustment Model is the accurate assignment of ICD-9-CM diagnosis codes. Both the Department of Health and Human Services and the Centers for Medicare and Medicaid Services require that all diagnoses be coded according to the ICD-9-CM Official Guidelines for Coding and Reporting and *Coding Clinic* guidelines.

Impact of HHS-HCC Model Variables, Demonstrated by Age Group

Adult Model: Male patient age 62 with the listed HCC relevant diagnoses captured during the year						
		Coefficients				
Demographic/Dx	HCC/Group	Platinum	Gold	Silver	Bronze	Catastrophic
Age 60+, Male	N/A	1.028	0.880	0.704	0.487	0.424
Staph Pneumonia	163	9.052	8.934	8.883	8.913	8.924
Sepsis	002	13.969	13.506	13.429	13.503	13.529
Kidney Transplant Status	183	10.944	10.576	10.432	10.463	10.482
End-Stage Renal Disease (superseded by HCC 183 above)	184	0	0	0	0	0
Interaction (Sepsis and Staff Pneumonia)	Medium Cost Interaction	2.498	2.648	2.714	2.813	2.841
Total		37.491	36.544	36.162	36.179	36.2

Child Model: Male patient age 20 with the listed HCC relevant diagnoses captured during the year

		Coefficients				
Demographic/Dx	HCC/Group	Platinum	Gold	Silver	Bronze	Catastrophic
Age 60+, Male	N/A	0.379	0.304	0.198	0.101	0.077
Staph Pneumonia	163	10.730	10.615	10.549	10.566	10.571
Sepsis	002	17.309	17.142	17.061	17.081	17.088
Kidney Transplant Status	183	43.158	42.816	42.659	42.775	43.808
End-Stage Renal Disease (superseded by HCC 183 above)	184	0	0	0	0	0
No interactions in the child model						
Total		71.576	70.877	70.467	70.523	71.544

Infant Model: Male patient age 1 with the listed HCC relevant diagnoses captured during the year

		Coefficients				
Demographic/Dx	Severity Level	Platinum	Gold	Silver	Bronze	Catastrophic
Maturity Category – Age 1						
Age 1, Male		0.117	0.102	0.094	0.065	0.054
Staph Pneumonia	Severity Level 4					

Sepsis	Severity Level 4					
Kidney Transplant Status	Severity Level 5					
End-Stage Renal Disease (superseded by HCC 183 above)						
Term * Severity Level 5		71.576	70.877	70.467	70.523	71.544
Total		71.693	70.979	70.561	70.588	71.598

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