



Current Risk Using the ACG[®] Methodology

ACG® Background

The Johns Hopkins Adjusted Clinical Groups (ACG®) Case-Mix and Predictive Modeling System is a statistically valid, diagnosis-based methodology that describes or predicts a population's past or future healthcare utilization and costs. It is:

- Developed and owned by The Johns Hopkins University and Bloomberg School of Public Health.
- Based on clinical observations and research performed to examine the relationship between morbidity or "illness burden" and healthcare services utilization.
- The ACG® System was based on the following findings:
 - Members using the most healthcare resources were not those with a single chronic illness, but rather those with multiple conditions.
 - Clustering of morbidity is a better predictor of health services resource use than the presence of specific disease.

ACG® Background (cont.)

- ACG®s were designed as a way to measure the “medical need” of populations – recognizing that members usually present with “morbidity profiles,” not a single specific disease.
- The Johns Hopkins ACG® Case-Mix and Predictive Modeling System has been available since 1992 and is distributed exclusively by DST Health Solutions, a global provider of technology-based services.



How the Risk Score is Calculated

Population

- Members enrolled in Medicaid during the reporting period
- Dual eligible Medicare/Medicaid members are excluded
- Additional criteria used for calculating risk score used in shared savings calculation:
 - Remove members with PCMH+ exclusions:
 - 1915(c), 1915(k), 1915(i) Waivers
 - Money Follows the Person
 - HUSKY B Members
 - Nursing Facility
 - Limited Benefit
 - State Funded Members
 - Behavioral Health Home Enrollees
 - Members with total costs > \$100,000 are truncated at \$100,000

Reporting Period

- Wave 1 members effective 1/1/2017
 - CY 2016 risk scores: paid claims with dates of service 1/1/2016-12/31/2016
 - CY 2017 risk scores: paid claims with dates of service 1/1/2017-12/31/2017

- Wave 2 members effective 4/1/2018 or 5/1/2018
 - CY 2017 risk scores: paid claims with dates of service 1/1/2017-12/31/2017

Aggregated Diagnosis Groups (ADGs)

- Risk is based on a member's diagnostic history, age, and gender during a one-year reporting period.
- A member's diagnosis codes are grouped into diagnosis clusters called Aggregated Diagnosis Groups (ADGs). ADGs form the building blocks of the ACG[®] System.
- ADGs are not disease-specific; however, diagnosis codes within the same ADG are similar in terms of both clinical criteria and expected need for healthcare resources.
- A member can be assigned to multiple ADGs based on his or her diagnostic history.

ADGs – Assignment Criteria

- The ACG® System uses specific logic to assign a diagnosis into one of 32 ADGs:
 - Duration
 - Persistence/recurrence over time – the expected length of time the condition will last.
 - Likelihood of return visit:
 - Acute conditions: time-limited and expected to resolve completely.
 - Recurrent conditions: occur episodically with disease-free intervals.
 - Chronic conditions: persist and require long-term management.
 - Severity
 - Likelihood of disability or decreased life expectancy.
 - Likelihood of hospitalization.

ADGs – Assignment Criteria (cont.)

- Diagnostic Certainty
 - Symptoms vs. documented disease.
 - Expected intensity of diagnostic work-up.

- Etiology
 - Infections, injury, behavioral health, etc.
 - Likelihood that different treatments will be needed based on the cause of the health condition.

- Expected Need for Specialty Care
 - Likelihood that specialty services will be required.
 - Expected need and cost of diagnostic or therapeutic procedures.

Examples of the 32 ADGs

ADG Number - Description	Duration	Severity	Etiology	Diagnostic Certainty	Expected Need for Specialty Care	Example Diagnosis
1 - Time Limited Minor	Acute	Low	Medical, Non-infectious	High	Unlikely	Dermatitis
3 - Time Limited Major	Acute	High	Medical, Non-infectious	High	Likely	Acute Cholecystitis
9 - Likely to Recur Progressive	Recurrent	High	Medical, Non-infectious	High	Likely	Diabetic Ketoacidosis
10 - Chronic Medical: Stable	Chronic	Low	Medical, Non-infectious	High	Unlikely	Essential Hypertension
11 - Chronic Medical: Unstable	Chronic	High	Medical, Non-infectious	High	Likely	Sickle-Cell Anemia
25 - Psychosocial: Recurrent or Persistent Unstable	Recurrent or Chronic	High	Psychosocial	High	Likely: Mental Health	Schizophrenia
26 - Signs/Symptoms: Minor	Uncertain	Low	Mixed	Low	Unlikely	Headache
32 - Malignancy	Chronic	High	Neoplastic	High	Likely: Oncology	Hodgkin's Disease

Mapping ADGs to ACG[®]s

- Adjusted Clinical Groups (ACG[®]s) represent a single, mutually exclusive category defined by the member's morbidity or overall disease burden, age, and gender.
- Members are assigned to one of 93 ACG[®]s based on their ADG assignments.

The ACG[®] Decision Tree

The Whole Population					
Non-Users	Single Morbidity (either acute or chronic)	Commonly Occurring Morbidity Combinations	Complex Morbidity Combinations	Pregnant Women	Infants (<12 months of age)
No utilization	Acute Minor	Acute Minor and Acute Major	2-3 morbidities	0-1 morbidities	0-5 morbidities
No diagnoses	Acute Major	Acute Minor and Likely to Recur	4-5 morbidities	2-3 morbidities	6+ morbidities
Invalid age	Likely to Recur	Acute Minor and Chronic Medical: Stable	6-9 morbidities	4-5 morbidities	
	Asthma	Acute Minor and Eye/Dental	10+ morbidities	6+ morbidities	
	Chronic Medical	Acute: Minor and Psychosocial			
	Chronic Specialty	Acute: Major and Likely to Recur			
	Eye		<ul style="list-style-type: none"> Further differentiated by age, sex, and major morbidities 	<ul style="list-style-type: none"> Further differentiated by major morbidities and delivery status 	<ul style="list-style-type: none"> Further differentiated by major morbidities and low birth weight
	Dental				
	Psycho-social				
	Preventive/ Administrative				

ACG® Assignment Example 1

Member Characteristics	Conditions	ADG Assignment	ACG Assignment	Risk Score	Resource Utilization Band	Total Cost
Moderate Risk Member with Neurologic Condition Male, Age 66	Quadriplegia and paraplegia	4 - Time Limited: Major-Primary Infections	3600 - Acute Minor/ Acute Major / Likely to Recur / Chronic Medical: Stable	0.76	3 - Moderate Risk	\$6,406
	Hypertension, w/o major complications	7 - Likely to Recur: Discrete				
	Low back pain	8 - Likely to Recur: Discrete-Infections				
	Peripheral neuropathy, neuritis	10 - Chronic Medical: Stable				
	Fluid/electrolyte disturbances	26 - Signs/Symptoms: Minor				
	Disorders of lipid metabolism	27 - Signs/Symptoms: Uncertain				
	Benign and unspecified neoplasm	28 - Signs/Symptoms: Major				
	Urinary symptoms					
	Urinary tract infections					
	Incontinence					
Iron deficiency, other anemia deficiencies						
High Risk Member with Neurologic Condition Male, Age 67	Quadriplegia and paraplegia	1 - Time Limited: Minor	5070 - 10+ Other ADG Combinations, Age 18+, 4+ Major ADGs	10.67	5 - High Risk	\$73,510
	Congestive heart failure	2 - Time Limited: Minor-Primary Infections				
	High impact malignant neoplasms	3 - Time Limited: Major				
	Malignant neoplasms, lung	4 - Time Limited: Major-Primary Infections				
	Fracture of neck of femur (hip)	7 - Likely to Recur: Discrete				
	Chronic renal failure	8 - Likely to Recur: Discrete-Infections				
	Acute renal failure	10 - Chronic Medical: Stable				
	Cardiac valve disorders	11 - Chronic Medical: Unstable				
	Hypertension, with major complications	18 - Chronic Specialty: Unstable-Eye				
	Hypertension, w/o major complications	22 - Injuries/Adverse Effects: Major				
	Peripheral vascular disease	23 - Psychosocial: Time Limited, Minor				
		24 - Psychosocial: Recurrent or Persistent, Stable				
	Gastrointestinal obstruction/perforation					
	Low impact malignant neoplasms	26 - Signs/Symptoms: Minor				
	Low back pain	27 - Signs/Symptoms: Uncertain				
	Seizure disorder	28 - Signs/Symptoms: Major				
	Nutritional deficiencies	29 - Discretionary				
	Depression	31 - Prevention/Administrative				
Fluid/electrolyte disturbances	32 - Malignancy					
Acute lower respiratory tract infection						
Respiratory failure						
+ 29 Low Impact Conditions						

ACG® Assignment Example 2

Member Characteristics	Conditions	ADG Assignment	ACG® Assignment	Risk Score	Resource Utilization Band	Total Cost
Low Risk Member with Depression Female, Age 32	Depression	24 - Psychosocial: Recurrent or Persistent, Stable	1300 - Psychosocial, w/o Psychosocial Unstable	0.46	2 - Low Risk	\$1,032
High Risk Member with Depression Female, Age 51	Depression	9 - Likely to Recur: Progressive	4940 - 6 to 9 Other ADG Combinations, Age 35+, 4+ Major ADGs	3.27	5 - Very High Risk	\$15,620
	Autoimmune and connective tissue diseases	10 - Chronic Medical: Stable				
	Refractive errors	11 - Chronic Medical: Unstable				
	Irritable bowel syndrome	12 - Chronic Specialty: Stable-Orthopedic				
	Chest pain	14 - Chronic Specialty: Stable-Eye				
	Musculoskeletal signs and symptoms	16 - Chronic Specialty: Unstable-Orthopedic				
	Cervical pain syndromes	25 - Psychosocial: Recurrent or Persistent, Unstable				
	Musculoskeletal disorders, other	27 - Signs/Symptoms: Uncertain				

Current Risk Score Calculation

- Current Relative Risk Score (RRS) is assigned to members based on their ACG® assignments.
- All members with the same ACG® assignments will have the same RRS.
- RRS represents the cost expectation of an individual compared to the average population. For example, a relative risk of 2.5 means that the individual is expected to cost two and a half times more than the average population.

ACG® Assignment	Total Cost
Average Cost / Members Assigned to ACG® 4430	\$11,056.82
Overall Average Cost of the population	\$4,948.26
Risk Score	
Risk Score for members assigned to ACG® 4430	2.23