

Episode-of-Care for 21-day Period around Colonoscopy

Measure Description

Resource use and costs associated with colonoscopy. Patients undergoing a colonoscopy are identified and the resource use and costs associated with colonoscopy in the 7 days before the procedure and the 14 days following the procedure are measured. For the group of patients with a colectomy that includes a primary diagnosis for colon cancer within the 14 day follow-up period, the episode will be from 7 days preceding the colonoscopy to 2 days preceding the colectomy. Those with a colectomy with a primary diagnosis of colon cancer within 2 days of the colonoscopy will be excluded from the measure.

Required Data Elements

Administrative claims data

Calculation

For patients meeting inclusion criteria, determine colonoscopy-related resource use and costs in the 7-day period preceding the colonoscopy and the 14 days following their colonoscopy. Those with a colectomy with a primary diagnosis for colon cancer within the 14 day follow-up period will be followed until two days prior to the date of the colectomy. Prices from a standard price list will be applied to the resource use to estimate the costs of the episode of care related to colonoscopy. Resources will be defined for nine categories: 1) inpatient facility; 2) outpatient facility; 3) evaluation and management; 4) procedures; 5) imaging; 6) tests; 7) DME; 8) other drugs and services; 9) medications; and 10) other. Population will be stratified based on age (40-75 yrs and \geq 76 yrs). For inpatient facility costs, the standard cost is based on a per diem cost for a DRG and will be multiplied by the length of stay for the index event. For each of the other resource use categories, standardized prices will be assigned to each type of utilization that is defined as colonoscopy related.

Episode Definition

Colonoscopy-related costs

Rationale

The Institute of Medicine and AQA have identified colon cancer as one of 20 conditions that should be considered priority areas in need of quality improvement based on its relevance to a significant volume of patients, its impact on those patients, and the perception of opportunity to significantly improve the quality and efficiency of related care. Colon cancer screening has also been identified as a priority area in other national

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initiatives including HRSA's Health Disparities Collaboratives and the Quality Improvement Program at CMS.¹

In 2001, Medicare expanded coverage of colorectal cancer screening to include colonoscopy. This has led to an increase in the number of colonoscopies that are performed annually in the United States. For those aged 50 years and older, the eligible proportion that had received a colonoscopy in 2001 was slightly less than 20% in women and slightly more than 20% in men.² By 2003, the proportion of the eligible population with a colonoscopy had increased to just below 30% for women and around 32% for men. Concerns have been raised with respect to disparities in colorectal cancer screening rates and limited access may further exacerbate these disparities if colonoscopy becomes the predominant screening modality. Furthermore, while rates of adverse events following colonoscopy are low, there were specific patient populations that were at higher risk for adverse events.³ The fact that disparities may exist due to access to colonoscopy and rates of high cost adverse events may also vary by patient and possibly provider characteristics, highlights the potential for differences in resource use and costs around the colonoscopy.

This measure focuses on the variation in resource use in the 21 day period surrounding a colonoscopy. The measure will include resources that are used in the seven days preceding the colonoscopy and resources that are used in the 14 days following the colonoscopy. There may be variability in the resource use due to the type of colonoscopy that is performed and other services subsequent to the initial colonoscopy. Particularly, there may be differential use of conscious sedation under the care of an endoscopist versus monitored anesthesia care with an anesthesiologist involved in the care when performing colonoscopy which may potentially influence the overall healthcare resource use. In addition, there may be differences in complication rates following colonoscopy that lead to differences in resource use related to the procedure. Therefore, the measure captures complication-related resource use in the days immediately following the procedure.

The measure is stratified by patient age because of the recommendations of the US Preventive Services Task Force cap the colorectal screening age at 75 years. Therefore, the population will be divided by age into those younger than 76 years of age and those 76 years and older. The resource use for this episode will be attributed to the provider that performed the colonoscopy. In addition, regional level estimates for the colonoscopy-related resource use will be compared.

Measures

¹ Priority Areas for National Action: Transforming Health Care Quality. Institute of Medicine. Karen Adams and Janet Corrigan Editors. March 10, 2003.

² Meissner HI, Breen N, Klabunde CN, Vernon SW. Patterns of colorectal cancer screening uptake among men and women in the United States. *Cancer Epidemiol Biomarkers Prev* 2006;15(2):389-394.

³ Warren JL, Klabunde CN, Mariotto AB, Meekins A, Topor M, Brown ML, Ransohoff DF. Adverse events after outpatient colonoscopy in the Medicare population. *Ann Intern Med* 2009;150(12):849-857.

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- Colonoscopy related resource use / costs
 - Inpatient Facility
 - Outpatient Facility (ambulatory surgical center, physician office, hospital outpatient)
 - Evaluation and Management
 - Procedures
 - Imaging
 - Tests
 - DME
 - Other drugs and services
 - Exceptions / Unclassified
 - Other
 - Pharmacy

Eligible Population

Age	Age \geq 40 yrs
Enrollment Criteria	Continuous medical and pharmacy benefit enrollment for at least one year preceding the measurement year and during the measurement year, with no more than one gap in enrollment of more than 45 days during each year of continuous enrollment.
Inclusion Criteria	Patients will be included in the measure if they have a procedure code for colonoscopy during the measurement period (see Table COL-A). The first occurring colonoscopy in the measurement period is used as the triggering event for inclusion in the cohort.
Exclusion	<p>Persons with any of the following diagnoses in the measurement year or the year prior to measurement are excluded (see table COL-H for codes):</p> <ul style="list-style-type: none">active cancer; end stage renal disease (ESRD); dialysis; renal failure; organ transplant; HIV/AIDS <p>Persons with any of the following diagnoses in the year preceding the colonoscopy or during the colonoscopy episode are excluded (see table COL-H5 for codes):</p> <ul style="list-style-type: none">ulcerative colitis; Crohn's disease; inflammatory bowel disease <p>Persons with colectomy with primary diagnosis of colon</p>

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cancer within 2 days of colonoscopy (see tables COL-H6 and COL-H7).

Table COL-A: Codes to identify colonoscopy

Description	CPT	HCPCs	ICD-9 Procedure
Colonoscopy, flexible, proximal to splenic flexure; diagnostic, with or without collection of specimen(s) by brushing or washing, with or without colon decompression (separate procedure)	45378		
with biopsy, single or multiple	45380		
with ablation of tumor(s), polyp(s), or other lesion(s) not amenable to removal by hot biopsy forceps, bipolar cautery or snare techniques	45383		
with removal of tumor(s), polyp(s), or other lesion(s) by hot biopsy or forceps or bipolar cautery	45384		
with removal of tumor(s), polyp(s), or other lesion(s) by snare techniques	45385		
Colorectal cancer screening; colonoscopy on individual at high risk		G0105	
Colorectal cancer screening; colonoscopy on individual not meeting criteria for high risk		G0121	
Colonoscopy			45.23
Endoscopic polypectomy of large intestine			45.42

These CPT, HCPCs or ICD-9 procedure codes, present in any field, will be used to identify colonoscopy patients during the measurement period, regardless of corresponding ICD-9 codes.

Table COL-B: Diagnosis codes to identify colonoscopy related services

Description	ICD-9
Vomiting ^a	787.0, 787.01, 787.03, 787.04
Dehydration	276.51
Abdominal pain	789.x
Fever	780.60, 780.61, 780.62
Perforation of intestine ^a	569.83
Gastrointestinal hemorrhage ^a	578
Blood in stool	578.1

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Hemorrhage of gastrointestinal tract, unspecified	578.9
Cardiopulmonary complications ^a	
Myocardial infarction	410.x, except 410.x2
Angina	413.x
Acute coronary syndrome	411.1, 411.8x
Cardiac dysrhythmias, arrhythmias	427.xx
Congestive heart failure (CHF)	428.xx, 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93
Cardiac or respiratory arrest	427.5, 518.81, 518.84, 799.1, 997.1
Syncope	780.2
Hypotension	458.9
Shock	518.5, 785.50, 785.51, 785.59, 998.0
Stroke ^a	431.x-438.x
Coagulation complications ^b	
Pulmonary embolism	415.1x
DVT	453.4x
Accidental Falls ^c	
Fall on or from stairs or steps	E880
Fall on or from ladders or scaffolding	E881
Other fall from one level to another	E884
Anesthesia-related adverse effects	
Unspecified adverse effect of anesthesia	995.22
Shock due to anesthesia, NEC	995.4
Malignant hyperthermia	995.86
Other specified adverse effects, NEC	995.89

These ICD-9 codes, present in any field, will be used to identify related services during the measurement period.

^a Vomiting, vomiting following gastrointestinal surgery, perforation, gastrointestinal hemorrhage, cardiopulmonary complications and stroke claims only included from day t_{-1} to day t_{+14} , where t is the date of the colonoscopy (event date)

^b Coagulation complications only included from day t_0 to day t_{+14} , where t is the date of the colonoscopy (event date)

^c Falls only included from day t_{-1} to day t_{+1} , where t is the date of the colonoscopy (event date)

Table COL-C: Imaging codes during colonoscopy episode

Description	CPT/HCPCs
Gastrointestinal Tract Imaging	
Diagnostic Imaging - Gastrointestinal Tract - Radiologic Examination - Colon, Barium Enema, With Or Without Kub	74270
Diagnostic Imaging - Gastrointestinal Tract - Radiologic Examination - Colon, Air Contrast With High Density Barium, With Or Without Glucagon	74280
Computed tomographic (CT) colonography (ie, virtual colonoscopy); screening	0066T
Computed tomographic (CT) colonography (ie, virtual colonoscopy); diagnostic	0067T
Abdominal Imaging	
Diagnostic Imaging - Abdomen - Radiologic Examination - Single Anteroposterior View	74000
Diagnostic Imaging - Abdomen - Radiologic Examination - Anteroposterior And Additional Oblique And Cone Views	74010
Diagnostic Imaging - Abdomen - Radiologic Examination - Complete, Including Decubitus And/Or Erect Views	74020
Diagnostic Imaging - Abdomen - Radiologic Examination - Complete Acute Abdomen Series, Including Supine, Erect, Decubitus, Chest	74022
Diagnostic Imaging - Abdomen - Computed Tomography - Without Contrast Material	74150
Diagnostic Imaging - Abdomen - Computed Tomography - With Contrast Material	74160
Diagnostic Imaging - Abdomen - Computed Tomography - Without Contrast Material, Followed By Contrast Material	74170
Diagnostic Imaging - Abdomen - Magnetic Resonance Imaging - Without Contrast Material	74181
Diagnostic Imaging - Abdomen - Magnetic Resonance Imaging - With Contrast Material	74182
Diagnostic Imaging - Abdomen - Magnetic Resonance Imaging - Without Contrast Material, Followed By Contrast Material	74183

These CPT codes will be used to identify colonoscopy-related services during the measurement period, regardless of corresponding ICD-9 codes.

Table COL-D: Procedure codes during colonoscopy episode

(see Table COL-A to identify repeat colonoscopies performed during measurement period)

Table COL-E: Laboratory and pathology codes during colonoscopy episode

Description	CPT/HCPCs
Consultations (Clinical pathology)	
Clinical Pathology Consultation, Limited, Without Review Of Patient's History And Medical Records	80500
Clinical Pathology Consultation, Comprehensive, For A Complex Diagnostic Problem, With Review Of Records	80502
Surgical Pathology	
Level I - Surgical Pathology, Gross Examination Only	88300
Level III - Surgical Pathology, Gross And Microscopic (Abscess, Colon, Colotomy, Hematoma, Soft Tissue Debridement)	88304
Level IV - Surgical Pathology, Gross And Microscopic (Colon Biopsy, Lymph Node Biopsy, Colorectal Polyp)	88305
Level V - Surgical Pathology, Gross And Microscopic (Colon, Segmental Resection, Other Than For Tumor, Liver Biopsy Or Partial Resection)	88307
Level VI - Surgical Pathology, Gross And Micoscopic (Colon, Resection For Tumor, Total Colon Resection)	88309
Special Stains, Histochemical With Frozen Section	88314
Consultation And Report On Referred Slides Prepared Elsewhere	88321
Consultation And Report On Referred Material Requiring Preparation Of Slides	88323
Consultation, Comprehensive, With Review Of Records And Specimens	88325
Immunohistochemistry (including tissue immunoperoxidase), each antibody	88342

These codes identify colonoscopy-related services during the measurement period, regardless of corresponding ICD-9 codes.

Table COL-F: Anesthesia codes related to colonoscopy

Description	CPT	HCPCs	ICD-9 Procedure
Anesthesia for lower intestinal endoscopic procedures, endoscope introduced distal to duodenum	00810		
Unlisted anesthesia procedure	01999		
Conscious Sedation			
Code deleted for 2006. To report, see 99143...99145 Sedation with or without analgesia (conscious sedation); intravenous, intramuscular or inhalation	99141		
Code deleted for 2006. To report, see 99143...99145	99142		

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Sedation with or without analgesia (conscious sedation); oral, rectal and/or intranasal			
Moderate sedation services (other than those services described by codes 00100-01999) provided by the same physician performing the diagnostic or therapeutic service that the sedation supports, requiring the presence of an independent trained observer to assist in the monitoring of the patient's level of consciousness and physiological status; younger than 5 years of age, first 30 minutes intra-service time	99143		
Moderate sedation services (other than those services described by codes 00100-01999) provided by the same physician performing the diagnostic or therapeutic service that the sedation supports, requiring the presence of an independent trained observer to assist in the monitoring of the patient's level of consciousness and physiological status; age 5 years or older, first 30 minutes intra-service time	99144		
Moderate sedation services (other than those services described by codes 00100-01999) provided by the same physician performing the diagnostic or therapeutic service that the sedation supports, requiring the presence of an independent trained observer to assist in the monitoring of the patient's level of consciousness and physiological status; each additional 15 minutes intra-service time (List separately in addition to code for primary service)	99145		
Moderate sedation services (other than those services described by codes 00100-01999), provided by a physician other than the health care professional performing the diagnostic or therapeutic service that the sedation supports; younger than 5 years of age, first 30 minutes intra-service time	99148		
Moderate sedation services (other than those services described by codes 00100-01999), provided by a physician other than the health care professional performing the diagnostic or therapeutic service that the sedation	99149		

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supports; age 5 years or older, first 30 minutes intra-service time			
Moderate sedation services (other than those services described by codes 00100-01999), provided by a physician other than the health care professional performing the diagnostic or therapeutic service that the sedation supports; each additional 15 minutes intra-service time (List separately in addition to code for primary service)	99150		

Table COL-G: Prescription medications identified as related to colonoscopy (all during the measurement period)

Class	Medications	Redbook THERCLS or HCPCs
Benzodiazepines	alprazolam, bromazepam, chlordiazepoxide, clonazepam, clorazepate, diazepam, lorazepam, medazepam, nordazepam, oxazepam, prazepam	64
Antibiotics	All	4, 6, 7, 9, 10, 11, 12, 16, 17
Pain medications		57, 58, 59, 60, 61, 62
Colonoscopy Prep Medications	Product Names: Tridate, Colyte Flavored, Oral Colonic Lavage, Trilyte w/Flavor Packs, Fleet Prep Kit (1-6), PEF 35550 & Electrolytes, Evac-Q-Kwik, Nulytely, Co-Lav, Go-Evac, Colyte, PEG-Lyte, Golytely, Lax Prepare, Moviprep	153 (not all meds in this class)
Anesthesia-related	Droperidol/fentanyl, meperidine, midazolam, fentanyl, diprivan, ketamine	J1810, J2175, J2180, J2250, J3010
Antiemetics, NEC		160
<i>TBD</i>	Atropine	
<i>TBD</i>	Reglan	

J-Code Medications

HCPC	Long Description
J1810	INJECTION, DROPERIDOL AND FENTANYL CITRATE, UP TO 2 ML AMPULE
J2175	INJECTION, MEPERIDINE HYDROCHLORIDE, PER 100 MG
J2180	INJECTION, MEPERIDINE AND PROMETHAZINE HCL, UP TO 50 MG
J2250	INJECTION, MIDAZOLAM HYDROCHLORIDE, PER 1 MG
J3010	INJECTION, FENTANYL CITRATE, 0.1 MG

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J0780	INJECTION, PROCHLORPERAZINE, UP TO 10 MG
J1260	INJECTION, DOLASETRON MESYLATE, 10 MG
J1626	INJECTION, GRANISETRON HYDROCHLORIDE, 100 MCG
J2405	INJECTION, ONDANSETRON HYDROCHLORIDE, PER 1 MG
J2469	INJECTION, PALONOSETRON HCL, 25 MCG
J2550	INJECTION, PROMETHAZINE HCL, UP TO 50 MG
J2765	INJECTION, METOCLOPRAMIDE HCL, UP TO 10 MG
J3230	INJECTION, CHLORPROMAZINE HCL, UP TO 50 MG
J3250	INJECTION, TRIMETHOBENZAMIDE HCL, UP TO 200 MG
J3280	INJECTION, THIETHYLPERAZINE MALEATE, UP TO 10 MG
J3310	INJECTION, PERPHENAZINE, UP TO 5 MG
J8498	ANTIEMETIC DRUG, RECTAL/SUPPOSITORY, NOT OTHERWISE SPECIFIED
J7030	INFUSION, NORMAL SALINE SOLUTION , 1000 CC
J7040	INFUSION, NORMAL SALINE SOLUTION, STERILE (500 ML=1 UNIT)
J7042	5% DEXTROSE/NORMAL SALINE (500 ML = 1 UNIT)
J7050	INFUSION, NORMAL SALINE SOLUTION , 250 CC
J7051	STERILE SALINE OR WATER, UP TO 5 CC
J7060	5% DEXTROSE/WATER (500 ML = 1 UNIT)
J7070	INFUSION, D5W, 1000 CC
J7100	INFUSION, DEXTRAN 40, 500 ML
J7110	INFUSION, DEXTRAN 75, 500 ML
J7120	RINGERS LACTATE INFUSION, UP TO 1000 CC
J7130	HYPERTONIC SALINE SOLUTION, 50 OR 100 MEQ, 20 CC VIAL

*Other services to be considered for inclusion later, upon review of data:
Supplemental oxygen, Cardiac monitors, pulse ox, capnography*

Table COL-H: Exclusion codes

The following codes will be used to identify exclusions during the identification period or the measurement period.

Table COL-H1: Codes to Identify Active Cancer Treatment

Description	ICD-9-CM Diagnosis
Cancer	140-208, 230-239

WITH

Description	CPT	ICD-9-CM Procedure	UB Revenue
Treatment	38230, 38240-38242, 77261-77799, 79000-79999, 96400-96549	41.0, 41.91, 92.2	028x, 033x, 0342, 0344, 0973

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Table COL-H2: Codes to Identify ESRD

Description	CPT	HCPCS	ICD-9-CM Diagnosis	ICD-9-CM Procedure	UB Revenue	UB Type of Bill	POS
ESRD (including renal dialysis)	36145, 36800-36821, 36831-36833, 90919-90921, 90923-90925, 90935, 90937, 90939, 90940, 90945, 90947, 90989, 90993, 90997, 90999, 99512	G0257, G0311-G0319, G0321-G0323, G0325-G0327, G0392, G0393, S9339	585.5, 585.6, V42.0, V45.1, V56	38.95, 39.27, 39.42, 39.43, 39.53, 39.93, 39.94, 39.95, 54.98	080x, 082x-085x, 088x	72x	65

Table COL-H3: Codes to Identify Organ Transplant

Description	CPT	HCPCS	ICD-9-CM Procedure	UB Revenue
Organ transplant	32850-32856, 33930-33945, 44132-44137, 44715-44721, 47133-47147, 48160, 48550-48556, 50300-50380	S2152, S2053-S2055, S2060, S2061, S2065	33.5, 33.6, 37.5, 41.94, 46.97, 50.5, 52.8, 55.6	0362, 0367, 0810-0813, 0819

Table COL-H4: Codes to Identify HIV

Description	ICD-9-CM Diagnosis
HIV	042

Table COL-H5: Codes to Identify Inflammatory Bowel Disease

Description	ICD-9-CM Diagnosis
Regional enteritis of small intestines	555.0
Regional enteritis of large intestines	555.1
Regional enteritis of small intestines with large intestine	555.2
Regional enteritis of unspecified site	555.9
Ulcerative enterocolitis	556.0
Ulcerative ileocolitis	556.1
Ulcerative proctitis	556.2
Ulcerative Proctosigmoiditis	556.3
Pseudopolyposis of colon	556.4
Left-sided ulcerative colitis	556.5
Universal ulcerative colitis	556.6
Other ulcerative colitis	556.8
Ulcerative colitis, unspecified	556.9

Table COL-H6: Codes to identify colectomy

Description	CPT
Open Colectomy	
Colectomy - Open - Partial; With Anastomosis	44140

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Colectomy - Open - Partial; With Skin Level Cecostomy Or Colostomy	44141
Colectomy - Open - Partial; With End Colostomy And Closure Of Distal Segment	44143
Colectomy - Open - Partial; With Resection, With Colostomy Or Ileostomy And Mucous Fistula	44144
Colectomy - Open - Partial; With Coloproctostomy	44145
Colectomy - Open - Partial; With Coloproctostomy And Colostomy	44146
Colectomy - Open - Partial; Abdominal And Transanal Approach	44147
Colectomy - Open - Total; Without Proctectomy, With Ileostomy Or Ileoproctostomy	44150
Colectomy - Open - Total; Without Proctectomy, With Continent Ileostomy	44151
Colectomy - Open - Total ; Abdominal With Proctectomy, With Ileostomy	44155
Colectomy - Open - Total; Abdominal With Continent Ileostomy	44156
Colectomy - Open - Total; Abdominal With Ileoanal Anastomosis, Includes Loop Ileostomy	44157
Colectomy - Open - Total; With Creation Of Ileal Reservoir, Includes Loop Ileostomy	44158
Colectomy - Open - Partial; With Removal Of Terminal Ileum With Ileocecostomy	44160
Laparoscopic colectomy	
Colectomy - Laparoscopic - Partial; With Anasomosis	44204
Colectomy - Laparoscopic - Partial; With Removal Of Terminal Ileum, With Ileocolostomy	44205
Colectomy - Laparoscopic - Partial; With End Colostomy And And Closure Of Distal Segment (Hartmann Type Procedure)	44206
Colectomy - Laparoscopic - Partial; With Anastomosis With Coloproctostomy	44207
Colectomy - Laparoscopic - Partial; With Anastomosis With Coloproctostomy And Colostomy	44208
Colectomy - Laparoscopic - Total; Abdominal Without Proctectomy, With Ileostomy Or Ileoproctostomy	44210
Colectomy - Laparoscopic - Total; Abdominal With Proctectomy, With Ileoanal Anastomosis, Creation Of Ileal Reservoir, Loop Ileostomy	44211
Colectomy - Laparoscopic - Total; Abdominal With Proctectomy, Ileostomy	44212

These CPT, codes, present in any field, will be used to identify colectomy patients during the measurement period, along with a corresponding ICD-9 code for colon cancer (See Table COL-H7).

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Table COL-H7: Diagnosis codes to identify colon cancer

Description	ICD-9
Malignant neoplasm of colon	153.x
Carcinoma in situ of colon	230.3

These diagnosis codes must be present as *primary* diagnosis on colectomy claim for patients to be flagged for the exclusion within 2 days of colonoscopy.

Risk Adjustment Method

Comorbid conditions identified as HCCs in 12 months preceding event date using inpatient and outpatient ICD-9 codes.

Episode Severity / Disease Staging

Patients included in the colonoscopy episode measure will be stratified by age (40-75 yrs and ≥ 76 yrs). The United States Preventive Services Task Force guidelines cap the recommendations for colonoscopy at age 75 which is the age that will be used to define the two strata for this measure.

Outlier Methodology

All individuals are included in the analysis with costs winsorized at the 2nd and 98th percentile.

Level of Measurement/Analysis

The level of measurement is at the provider performing the colonoscopy. In addition, measurements will be summarized at the region level.

Note: Portions of these measure specifications are based on existing HEDIS measure specifications.