HIGH-VALUE HEALTH CARE PROJECT

An initiative of the Quality Alliance Steering Committee

Characterizing Episodes and Costs of Care (C3)

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American Board of Medical Specialties

Research and Education Foundation

Supported By:
Robert Wood Johnson Foundation
Engelberg Center for Health Care Reform at the Brookings Institution

C3 Project - Overview

- Funded by the Robert Wood Johnson Foundation
- Project directed by Kevin Weiss, President and CEO, ABMS REF
- Project Period: 12/17/07 - 12/16/10
- Project goal: to develop and test episode-based cost of care measure specifications for 12 of the 20 conditions prioritized by AQA*

• Acute MI	COPD	Hiatal Hernia (GERD)
• Angina / CAD	Colon Cancer	Low Back Pain
• Asthma	CHF	Pneumonia
• Breast Cancer	Diabetes	Sinusitis

* http://www.aqaalliance.org/files/CandidateListofConditionsforCostofCareMeasurementApproved.pdf

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C3 Project - Overview

- Process for Development of Measures
  - Open and transparent with wide range of input
  - Technical Advisory Committee (TAC) and the Quality Alliance Steering Committee's (QASC) Episodes workgroup
    - High-level oversight and external review of measure testing results
    - TAC and QASC Episodes workgroup include: physicians, consumers, health plans, insurers, businesses, AHRQ, CMS, NCQA, and NQF
  - Physician Workgroups
    - 6-8 members with clinical and technical expertise for each condition
    - Considered natural progression of disease/condition and best practices to construct the framework of the episodes.

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C3 Project - Overview

- Development of Measures
  - Each measure was developed independently
  - Not summative/no composite score
  - Intended to focus on resource use in specific cohorts of patients
  - Aim for eventual pairing with quality measures

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Measures Submitted to NQF

Acute Myocardial Infarction (AMI)
- Episode-of-Care for 30 days following onset
- Episode-of-Care for Post-Acute Period (Days 31-365 post-AMI)

Angina / Coronary Artery Disease (CAD)
- Episode-of-Care for Chronic Stable CAD Management over One Year
- Episode-of-Care for CAD Management Post-Revascularization

Asthma
- Episode-of-Care for Treatment of Asthma over One Year

Breast Cancer
- Episode of Breast Biopsy
- Episode-of-Care for One Year Following New BC Diagnosis

Chronic Obstructive Pulmonary Disease (COPD)
- Episode-of-Care for One Year of Stable Patient Management
- Episode-of-Care for One Year of Unstable Patient Management

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Measures Submitted to NQF

Colon Cancer / Colonoscopy

--Episode-of-Care for a 21 day period around a Colonoscopy

--Episode-of-Care for Treatment of Localized Colon Cancer

Congestive Heart Failure (CHF)
- Episode-of-Care for Post-Hospitalization Management
- Episode-of-Care for Chronic Management over a One Year Period

Diabetes
- Episode-of-Care for One Year of Diabetes Management

Low Back Pain (LBP)
- Episode-of-Care for New Onset LBP without Radiculopathy
- Episode-of-Care for New Onset LBP with Radiculopathy

Pneumonia
- Episode-of-Care for Treatment of Pneumonia in Ambulatory Setting
- Episode-of-Care for Treatment of Pneumonia in Hospital Setting

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Data Protocol

- Measures designed to be used with administrative claims
- Recommend users not impute missing data
- Include paid claims with non-missing enrollee identification numbers, primary procedure and diagnosis codes
- Set claim lines with missing or zero quantity values to one
- Eliminate claim lines missing enrollee id, primary dx. and proc. Codes

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Clinical Logic

- Clinical logic for each measure developed in keeping with NQF episodes framework, the natural progression of the disease or condition and clinical evidence of best practices
- Includes codes for all condition-specific, relevant resource use –whether clinically appropriate or inappropriate:
  - Inpatient, Outpatient, Procedures and Labs, Imaging, Pharmacy, DME
- Most workgroups developed two separate measures (all but asthma and diabetes) in order to achieve homogeneous patient cohorts
- For most chronic measures, triggers and end dates reflect a 1 year period (does not have to be calendar year)
- For acute measures , unique trigger and end dates defined by workgroups

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Construction Logic

- Eligible population identification
  - Identify patients that meet inclusion criteria
  - Identify patients that meet age, eligibility and continuous enrollment criteria
    - --require full medical and pharmacy Benefits in both identification and measurement year
    - --require minimum of 320 days coverage each year
  - Identify patients that meet exclusion criteria
    - --most measure have standard NCQA exclusions (active CA, ESRD, organ transplant, HIV) plus condition-specific exclusions
  - Combine steps to identify eligible population

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Construction Logic

- Eligible Event Identification
  - Using the codes selected in the clinical logic, identify resource use for all appropriate categories (inpatient, outpatient, procedures labs, imaging, pharmacy, DME)
- Assignment of Standardized Prices
  - Three separate methodologies are used to derive the standardized prices:
    - inpatient facility charges
    - ambulatory pharmacy charges
    - all other charges
- Creation of Episode-Specific Strata (when applicable)
  - Measure specific

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Risk Adjustment

- The model developed for comorbidity adjustment uses Hierarchical Condition Categories (HCC) to identify comorbidities.
- The CMS and NCQA model use HCCs to adjust TOTAL costs of care, whereas our model focuses on episode-specific costs of care.
- Utilized quasi-Modified Delphi approach with the condition-specific workgroup to categorize HCCs into three groups:

  Include in risk adjustment model

  Exclude in risk adjustment model

  Test impact in risk adjustment model

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Risk Adjustment

- Tested 12 different model specifications where the HCCs included in the model varied, and the distribution and link functions in the generalized linear models also varied.
- Models were developed in a split sample approach with 75% of the population randomly selected for model development and the remaining 25% used in model evaluation. Model performance was also evaluated in the full cohort.
- The performance of each model was evaluated through comparisons of: observed and predicted distributions, residuals, absolute differences between observed and predicted, observed-to-predicted ratios, and mean squared errors across models.
- Summary information on models was presented to the workgroup for selection of a risk adjustment model for the condition.

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Attribution

- Most measures are attributed at level of individual MD (Not: Breast CA, Acute AMI, CAP Hospitalization)
- Many with individual MD attribution use tiered approach :
  - Tier 1 – Single Attribution: if one provider ID has at least 70% of an episode's E&M visits, that provider will be attributed the episode
  - Tier 2 – "Multiple" Attribution: if no provider has at least 70% of the episode's E&M visits, any provider with at least 30% will be attributed the episode
  - Tier 3 – No Attribution: if no provider has at least 30% of the episode's E&M visits, no provider will be attributed the episode

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Reporting

- The provider summaries are a report of the resource use for an attributable unit (hospital or provider) compared to their peer group, their non-peer group and all episodes in the dataset.
- Creation of the provider summaries uses the summary episode costs combined with the attributable provider data and the risk adjusted episode costs.
- Summarize s the observed, expected and observed-to-expected ratio for each provider type, overall, and within each strata

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Sample Provider Summary Report

Report for Physician #xxxxx
Provider type = insert specialty

	MD	Peer Group	Non-Peer Group	National Avg
Episodes	21	9,512	68,434	77,967
Observed Costs*				
Average	$ 897	$ 992	$ 1,481	$ 1,421
Min	$ 45	$ 12	$ 12	$ 12
Median	$ 747	$ 538	$ 853	$ 807
Max	$ 2,797	$ 11,140	$ 11,140	$ 11,140
Predicted Costs				
Average	$ 1,400	$ 1,083	$ 1,523	$ 1,470
Min	$ 966	$ 831	$ 831	$ 831
Median	$ 1,126	$ 1,039	$ 1,502	$ 1,392
Max	$ 2,345	$ 8,286	$ 6,883	$ 8,286
Observed-to-Expected Ratio				
Average	0.64	0.91	0.98	0.97
Min	0.03	0.01	0.01	0.01
Median	0.54	0.51	0.58	0.57
Max	1.54	13.40	13.40	13.40
% ≥ 2.0	0%	10.9%	11.6%	11.5%
% ≥ 2.5	0%	7.0%	7.7%	7.6%
% ≥ 75th percentile peers	50.0%	(0%, 20.9%)		

* Observed costs adjusted for outliers (windsorized)

Notes:

- Use Model 12
- Includes all episodes

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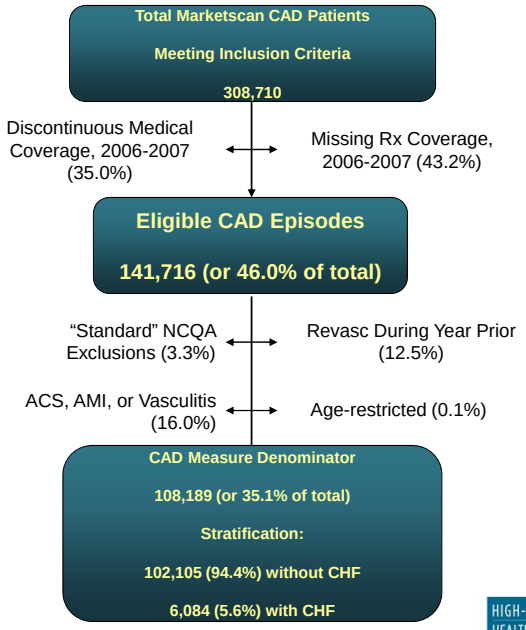
CAD Chronic Measure Denominator

- 12 months of CAD management/care for patient with 1+ CAD ambulatory care visits during previous year
- Measurement window: January 1, 2007 – December 31, 2007
- Test data: Marketscan 2006-2007
- Note: exclusions are not additive (double-counting occurs often)



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Resource Use by Type of Service: Chronic CAD, CAD specific

Description	Mean	% of Total	5th %	25th %	50th %	75th %	95th %
Inpatient Facility Charge	$1,306	32%	$0	$0	$0	$0	$7,677
Evaluation and Management	$448	11%	$0	$63	$157	$314	$1,842
Procedures	$256	6%	$0	$0	$0	$0	$1,563
Imaging	$395	10%	$0	$0	$20	$616	$1,626
Tests	$144	3%	$0	$0	$71	$189	$500
Durable Medical Equipment	$15	0%	$0	$0	$0	$0	$0
Other Services	$47	1%	$0	$0	$0	$0	$186
Unclassified	$7	0%	$0	$0	$0	$0	$0
Drug Charges	$1,498	36%	$0	$599	$1,331	$2,203	$3,635
Sum of charges	**$4,116**	**100%**	**$80**	**$1,124**	**$2,210**	**$3,816**	**$15,299**

Chronic CAD: Resource Use by Type of Service vs. Overall Mean, by Specialty*

- Results presented for high-volume specialties: 1-5

Description	Mean	Cardiology	Internal Medicine	Family Practice	Medical Doctor NEC	Multi-Specialty Group
N	**37,838**	**19,570**	**9,177**	**8,287**	**2,994**	**1,866**
Inpatient Facility	$2,104	0.99	0.87	0.88	1.11	1.06
DME	$10	0.92	0.97	1.43	1.02	1.08
OP Facility	$434	1.02	0.77	0.68	1.04	0.75
Imaging	$543	1.22	0.93	0.80	0.92	0.81
E&M	$358	0.97	1.04	1.03	1.00	0.99
Other Services	$54	1.00	0.78	0.88	1.01	1.18
Procedures	$315	1.12	0.79	0.74	1.05	0.93
Tests	$180	1.10	0.99	0.91	0.92	1.04
Unclassified	$4	1.32	0.38	0.51	0.37	0.32
Drug Costs	$1,585	1.06	0.99	0.95	0.99	1.00
Total	**$5,588**	**1.04**	**0.91**	**0.88**	**1.04**	**0.99**

* Individual episodes may be attributed to as many as three providers, and so the resource use associated with any given episode may be reflected in the results for up to three provider specialties.

Questions ?

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