Bridges to Excellence

Cardiac Care Analysis – Savings Estimates

December 29, 2003

Towers Perrin

Today's Discussion

- Background
- NCQA CCL measures
- Patient eligibility criteria
- Overall savings estimates
- Issues for setting Physician Bonus Payments
- Savings estimates for each measure
  - Assumptions
  - Data Sources

Appendix

- Cost and Incidence data – GE and MarketScan
- Review of published literature

Background

- Bridges to Excellence is a multi-stakeholder program designed to advance the “pay for quality” concept across the healthcare system
  - Co-launched in April 2003 by GE, Ford, UPS, P&G, Verizon and other companies
  - Rewards physicians for stellar performance
- Initially aimed at improving diabetes and cardiovascular care and rewarding physicians who use systematic care management processes
  - Diabetes and cardiovascular disease are among the nation’s costliest, most serious health issues
- Savings and ROI for Diabetes Care Link (DCL) and Physician Office Link were developed earlier this year and these programs are being piloted
  - Diabetes Care Link savings = $350 per patient per year
  - Physician Office Link savings = $110 per patient per year

Background

- **Cardiac Care Link (CCL)** is the third program to be developed and is being built around the Heart/Stroke Recognition Program (HSRP)
  - Jointly developed by NCQA and the American Heart Association/American Stroke Association
  - Awards physicians annual bonus payments
- Estimated U.S. spending for Heart disease and related conditions of Stroke and Cardiovascular disease is nearly $100 billion annually -- over twice the amount spent on Cancer (source: *Health Affairs, March/April 2003*)
  - Includes direct medical costs for hospitalizations, doctors' visits, surgery and other treatments, tests and drugs
  - Excludes lost wages or productivity costs
- Bridges to Excellence has asked Towers Perrin to perform an actuarial evaluation of the estimated savings per cardiac patient for high performance in cardiac care.
  - Starting point for determining incentive payments to qualifying physicians and patients
- Preliminary savings estimates were developed based on general population data (see October 6, 2003 report); this report contains updated savings estimates based on cost and incidence data for GE and MedStat's MarketScan database.

NCQA CCL Measures

Measure	Criteria[1]
Blood pressure control < 140/90 mm Hg	**75%**

BP Result	Credit Toward Numerator
< 140/90 mm Hg	1.00
<145/90 or <140/95 mm Hg	0.75
< 145/95 mm Hg	0.50
> 145/95 mm Hg	0.00

Completion of Lipid Profile	**80%**
LDL control < 100 mg/dl	**50%**

LDL Result	Credit Toward Numerator
<100 mg/dl	1.00
100 - 109 mg/dl	0.75
110 - 119 mg/dl	0.50
120 - 129 mg/dl	0.25
> 130 mg/dl	0.00

Use of aspirin or other antithrombotic	**80%**
Notation of smoking status and cessation advice or treatment	**80%**

[1] % of patients who meet standard

Certification can be achieved if 4 out of 5 measures are met

NCQA CCL Measures

- Partial credit is given for patients who meet less stringent standards for Blood pressure control and LDL control
  - Recognizes risk reduction associated with marginal improvements in blood pressure and LDL levels
  - Savings estimates are based on “full credit” standards; reductions in savings for partial credit standards are assumed to be offset by reduced credits
- Thresholds for percentage of patients who meet standard vary
  - Lower thresholds mean measure is easier to meet, but also dilute savings per CVD patient

Patient Eligibility Criteria

- Eligible cardiovascular disease or stroke patients must meet **all** three of the following criteria:
  1. Is 18 years of age or older
  2. Has had a diagnosis of Ischemic Vascular Disease (IVD) for at least 12 months
  3. Has been under the care of the applicant physician for IVD for at least 12 months
- Patients are identified as having a diagnosis of Ischemic Vascular Disease if the patient's medical record contains a Diagnosis or CPT code for:
  - Coronary Artery Disease
  - Acute Myocardial Infarction
  - Stable Angina
  - Percutaneous Coronary Intervention
  - CABG
  - Lower Extremity Arterial Disease/Peripheral Arterial Disease
  - Ischemia
  - Stroke
  - Atheroembolism

Note: Patients with a diagnosis of Hypertensive Disease **only** are *not* included in the eligible patient population

Overall Savings Estimates

Measure	Savings per Patient
Blood pressure control < 140/90 mm Hg	$547
Completion of Lipid Profile	$0
LDL control < 100 mg/dl	$91
Use of aspirin or other antithrombotic	$168
Notation of smoking status and cessation advice or treatment	$12

Savings vary significantly for the 5 measures and are *not* additive
Estimated Savings per patient = $547 with Blood pressure measure vs. $271 without Blood pressure measure

Issues for setting Physician Bonus Payments

- Different levels of bonus payments are appropriate to reflect variation in savings estimates for the five CCL measures
  - Certification can be achieved by satisfying at least one measure with little or no direct savings (completion of lipid profile or smoking cessation)
- Savings are greatest if Blood Pressure measure is met
  - Savings from outcomes measures (Blood Pressure and LDL control) are assumed to be non-additive
  - To be conservative, incremental savings from process measures (Aspirin use and Smoking cessation) have been ignored if Blood Pressure measure is met
- Total savings for physicians who satisfy all measures *except* blood pressure control are approximately half the savings for physicians who achieve certification by meeting the blood pressure measure
  - Full credit is given for savings from process measures where certification is achieved without blood pressure measure
    - Aspirin use is strongly correlated with improved outcomes and savings are well documented
    - Only nominal savings are associated with smoking cessation

Savings Estimates - Blood Pressure Control

Standard: Full credit given for Blood Pressure control < 140/90 mm Hg
Partial credit for Blood Pressure control < 145/95 mm Hg

Savings per patient:

	% of CVD patients	Incidence Rate of MI & Stroke per 1,000 CVD patients	Relative Risk
Normal	18%	50.3	1.00
Hypertensive	82%	125.8	2.50
Total		112.4	2.23
Cases saved per 1,000		75.5	
Cost per event		$11,755	
% of patients with Hypertension		82.2%	
Savings per person		$730	
% patients needed to qualify		75%	
Savings per patient		**$547**	

Note: Savings estimate is based on Full Credit standard (BP < 140/90mm HG); reductions in savings for Partial Credit standards are assumed to be offset by reduced credits

Savings Estimates - Blood Pressure Control

Assumptions and Data sources:

❶ Relative risk of stroke and CHD is 2.5 x as great for patients with hypertension vs. those with normal blood pressure

Sources: Framingham Heart Study
Hypertension online

❷ 82% of CVD patients have hypertension

Source: Heart Disease and Stroke Statistics - 2003

❸ Annual incidence per 1,000 CVD patients:

MI = 90.5

Stroke = 21.9

Total = 112.4

Source: MedStat – GE patients with Coronary Artery/Cerebrovascular Disease (see Appendix)

❹ Cost per event (MI or Stroke): $11,755

Source: MedStat – GE experience (see Appendix)

Savings Estimates - Completion of Lipid Profile

Standard: Completion of a lipid profile during the abstraction period or the 12 months prior to the abstraction period that includes:

1. Total serum cholesterol
2. Serum triglyceride
3. High-density lipoprotein (HDL)
4. Low-density lipoprotein (LDL)

Savings per patient: No savings are directly attributed to completion of a lipid profile

Savings Estimates - LDL Control

Standard: Full credit given for LDL control < 100 mg/dl
Partial credit for LDL control < 130 mg/dl

Savings per patient:

LDL Level	Incidence Rate of MI & Stroke per 1,000 CVD Patients	Relative Risk
<100 mg/dl	96.9	1.0
> 100 mg/dl	116.3	1.2
Total	112.4	
Cases Saved per 1,000	19.4	
Cost per Event	$11,755	
% of patients with LDL > 100 mg/dl	80%	
Savings per Person	$182	
% of patients needed to qualify	50%	
Savings per Patient	**$91**	

Note: Savings estimate is based on Full Credit standard (LDL < 100 mg/dl); reductions in savings for Partial Credit standards are assumed to be offset by reduced credits

Savings Estimates - LDL Control

Assumptions and Data sources:

❶ Relative risk of first cardiovascular event is 20% greater for patients with LDL > 100 mg/dl

Source: Comparison of C-Reactive Protein and Low-density Lipoprotein Cholesterol levels in the Prediction of First Cardiovascular Events; NEJM, Vol. 347, No. 20, November 14, 2002

Quintile of LDL Cholesterol		LDL	Risk Factor *
Low	1	< 97.6 mg/dl	1
	2	> 97.6 - 115.4 mg/dl	0.9
	3	> 115.4 - 132.2 mg/dl	1.1
	4	> 132.2 - 153.9 mg/dl	1.3
High	5	> 153.9 mg/dl	1.5
		Average	1.16

Composite risk factor > 100 mg/dl ≈ 1.20

* Relative Risk of a first cardiovascular event according to the quintile of LDL cholesterol at base line

Note: Cardiovascular event includes nonfatal MI, nonfatal ischemic stroke, coronary revascularization procedures and death from cardiovascular causes

❷ Annual incidence and Cost per event (MI & Stroke):

Incidence per 1,000 CVD patients = 112.4

Cost per event = $11,755

Source: MedStat - GE experience

Savings Estimates - Aspirin Use

Standard: Recommendation for and documentation of Aspirin Use

Savings per patient:

Cases Saved per 1,000	
Primary prevention - patients with CVD	5.07
Secondary prevention	12.75
Total - primary & secondary prevention	17.82
Cost per Event	$11,755
Savings per Person	$209
% of patients needed to qualify	80%
Savings per Patient	**$168**

Savings Estimates - Aspirin Use

Assumptions and Data sources:

1. Risk reduction per 1,000 [1]
   - Secondary prevention
     Number of CVD events prevented per 1,000 patients treated for 2 years = 36
     Annual reduction per 1,000 patients with MI or Stroke = 18
     % of CVD patients with MI or Stroke = 28.2%
     Annual reduction per 1,000 CVD patients = 5.07
   - Primary prevention (patients with CVD)
     Number of CVD events prevented per 1,000 patients treated for 4 years = 51
     Annual reduction per 1,000 CVD patients = 12.75

   [1] Reduction in number of fatal and nonfatal cardiovascular events

   Source: Aspirin as an Antiplatelet Drug, NEJM

2. Cost per event (MI & Stroke) = $11,755
   Source: MedStat – GE experience

Savings Estimates - Smoking Cessation Advice and Treatment

Standard: Identification and documentation of Smoking Status, and for current smokers, cessation advice given

Savings per patient:

Smoking Status	Incidence Rate of MI & Stroke per 1,000 CVD patients	Relative Risk
Non-Smoker	98.8	1.00
Smoker	155.5	1.58
Total	112.4	
Reduction in incidence rate	56.8	
% of patients who smoke	24%	
Incremental abstinence rate	9.6%	
Cases saved per 1,000 CVD patients	1.31	
Cost per Event	$11,755	
Savings per Person	$15	
% of patients needed to qualify	80%	
Savings per Patient	**$12**	

Preliminary Savings Estimates - Smoking Cessation Advice and Treatment

Assumptions and Data sources:

❶ Relative risk of CHD for Smokers vs. Non-Smokers

	Relative risk of CHD			% of population	Incidence rate per 1,000
	Men	Women	Composite		
Non-smokers	1.00	1.00	1.00	76%	98.8
Smokers	1.68	1.47	1.58	24%	155.5
All CVD patients					112.4

Source: Wilson, WF, D'Agostino, RB, et al. Prediction of Coronary Heart Disease Using Risk Factor Categories, *Circulation*, May 12, 1998

❷ % of population who smoke = 24%

Source: CDC Tobacco use -- United States 1990-1999

❸ Abstinence rate with and without advice or treatment

Abstinence rate without advice	7.9%
Abstinence rate with advice / treatment	17.5%
Incremental abstinence rate	**9.6%**

Source: Fiore MC, Bailey WC, Cohen SJ, et al. Smoking Cessation. Clinical practice guideline No. 18

❹ Cost per event (MI & Stroke) = $11,755

Source: MedStat – GE experience

Appendix

Incidence of Cardiovascular disease and Stroke

- Savings estimates are based on cost and incidence data obtained from MedStat for GE's active and pre-65 retiree population
- The prevalence of cardiovascular disease and stroke among GE's population is similar to MedStat's MarketScan database:

	GE	MarketScan
Number of Covered Lives	211,691	689,002
Number of CVD Patients	8,475	34,453
Prevalence of CVD per 1,000 lives	**40.04**	**50.00**
Number of CVD Patients:		
With MI or Stroke in Baseline Year	2,388	10,614
Without MI or Stroke in Baseline Year	6,088	23,839
% of CVD patients with MI or Stroke	**28.2%**	**30.8%**

- MI and Stroke incidence are based on two year's experience for GE CVD patients:

Incidence of MI and Stroke per 1,000 CVD patients		
Number of CVD Patients	8,475	
Number of Patients with MI or Stroke	MI	Stroke
Year 1	924	208
Year 2	610	163
Average	767	185.5
Incidence per 1,000 CVD patients	**90.5**	**21.9**

Cost per Event – MI and Stroke

- The average cost per event of MI and Stroke is based on the incremental average annual cost per patient for CVD patients with MI or Stroke vs. the cost for patients without MI or Stroke in the baseline year
- Savings estimates are conservatively based on GE costs, which are lower than MarketScan

Average cost per patient with MI or Stroke in base year vs. without MI or Stroke in base year

	GE Data	MarketScan Data
Baseline Year:	*7/2000 - 7/2001*	*1998*
Patients with MI or Stroke	$19,234	$20,096
Patients without MI or Stroke	$9,325	$9,214
Incremental cost of MI or Stroke	$9,909	$10,882
Trend to CY 2004 @ 5%	**$11,755**	**$14,582**

Review of published literature

- The scope of work for the CCL analysis included reviewing data supporting the measures defined by the NCQA in the HSRP
- Data sources included those contained in the following documents:
  - Blood pressure work-up (HSRP)
  - Aspirin work-up (HSRP)
  - Lipid profile work-up (HSRP)
  - Smoking cessation work-up (HSRP)
- We reviewed the following documents through Internet sources or the NLM Pubmed's abstracting services:
  - Blood pressure - References 1-5, 7, 10-13, 19
  - Aspirin - All references
  - Lipid profile - 1, 4, 5, 6, 10, 11, 18, 20-30
  - Smoking cessation - 4 - 9, 11- 15, 18-24, 27-32, 34-37, 39-40, 42-45, 48-49
  - Abstracts were not available for the other references and these have not been verified
- Sources reviewed generally supported the text of each HSRP work-up
- Additional sources were also reviewed

Additional Data sources

1. Ridker, PM, et al, Comparison of C-Reactive Protein and Low-density Lipoprotein cholesterol levels in the prediction of first cardiovascular events, NEJM, Vol. 347, No. 20, November 14, 2002
2. Murray, CJ, et al, Effectiveness and costs of interventions to lower systolic blood pressure and cholesterol: a global and regional analysis on reduction of cardiovascular-disease risk, The Lancet, Vol. 361, March 1, 2003
3. Wilson, WF, et al, Prediction of Coronary Heart Disease using Risk Factor Categories, Circulation, May 12, 1998
4. He, J and Whelton, PK, Elevated systolic blood pressure and risk of cardiovascular and renal disease: Overview of evidence from observational epidemiologic studies and randomized controlled trials (American Heart Journal, Sept. 1999)
5. Gaspoz, JM, et al, Cost Effectiveness of Aspirin, Clopidogrel or both for Secondary prevention of Coronary Heart Disease, NEJM, Vol. 346, June 6, 2002
6. Patrono, C, Aspirin as an Antiplatelet Drug, NEJM, Vol. 330, May 5, 1994
7. Probstfield, JL, How Cost-effective are new preventive strategies for Cardiovascular disease?, American Journal of Cardiology, Vol. 91, May 22, 2003
8. Heart Disease and Stroke Statistics - 2003 Update, American Heart Association