

Calculation of SOP Related to Limits on the Growth in Cost Per CMAD

Nancy M. Kane, DBA
Consultant to the Dirigo Health Agency
September 15, 2005

According to the Dirigo health care reform act, "each hospital...is asked to voluntarily restrain cost increases, measured as expenses per case mix adjusted discharge, to no more than 3.5% for the hospital fiscal year beginning July 1, 2003 and ending June 30, 2004." (Section F-1, 1B). The Dirigo Health Board is to establish a savings offset payment amount to be paid by health insurance carriers and other claims payers at a rate that "may not exceed savings resulting from decreasing rates of growth in the State's health care spending and in bad debt and charity care costs." (Section 6913, 2)

Methodology for Measuring Hospital Expenses, Case Mix, and Adjusted Discharges

Hospital Expense, Discharge and Case Mix

This analysis reports on the savings resulting from decreasing rates of growth in hospital costs per case-mix adjusted discharge (CMAD) during the Dirigo Fiscal Year July 1, 2003 to June 30, 2004, based on a cost and discharge methodology proposed by the Maine Hospital Association (MHA). In June, 2005, the MHA provided the consultant with a spreadsheet showing hospital CMAD for hospital fiscal year 2003, with costs taken from the Medicare Cost Report, Worksheet C, and case mix indices (using CMS case weights applied to all discharges) and discharges derived from discharge data provided by the Maine Health Data Organization (MHDO). Discharges were adjusted for outpatient activity according to the methodology proposed by the MHA:

Inpatient discharges (including newborns) multiplied by the Case Mix Index derived using CMS case weights applied to all payer discharges

Plus

Outpatient-adjusted discharges, calculated as Outpatient Gross Patient Service Revenue divided by Inpatient Gross Patient Service Revenue Per Inpatient Discharge.

The consultant used the MHA spreadsheet as a template off which she calculated the Baseline Years CMAD (2001-2003) and 2004 CMAD data, using the same data sources to determine 2000-2004 hospital expenses, discharges, and case mix indices. Minor modifications were made to the MHA template as described in Appendix A to enable year-to-year comparisons using consistent measurements and entities over the period of analysis.

Fiscal Year Adjustment

The cost data is provided in terms of hospital fiscal years, so it requires an adaptation to the Dirigo fiscal year in order to be compliant with the time period prescribed in the legislation (July 1, 2003 – June 30, 2004). Hospital fiscal years do not correspond to the Dirigo fiscal year (July 1 – June 30) for 26 of the 36 hospitals analyzed. To get to the Dirigo fiscal year, the analysis weighted the hospital fiscal year CMAD by the number of months of overlap with the Dirigo fiscal year, to come up with a Dirigo fiscal-year-adjusted CMAD. For the rest of this report, the term CMAD means CMAD adjusted to the Dirigo fiscal year.

Table 1 describes the hospital fiscal years and how they overlap to the 2003-2004 Dirigo fiscal year.

2004 Hospital FY Begins:	4/1/2003	5/1/2003	6/1/2003	7/1/2003	10/1/2003	1/1/2004
# Hospitals	2	2	1	10	13	8
# Months overlap with Dirigo FY 2004	9	10	11	12	9	6
Weighting scheme applied to hospital FY CMAD to match Dirigo FY*	.75*2004 +.25*2005	.83*2004+ .17*2005	.92*2004 +.08*2005	=2004	.25*2003 +.75*2004	.5*2003 +.5*2004

*2005 not yet available, so the SOP was calculated using only a partial year, but assuming the 2004 growth rate based on the 2004 data available.

It is appropriate from a practical and theoretical standpoint to use the Dirigo fiscal year as the basis for measuring cost containment effort, because hospitals knew about the cost limit possibility in the spring of 2003, during the development of the Dirigo Act. Thus hospitals were prepared to and subsequently did initiate cost constraints in accordance with the Dirigo fiscal year. The alternative possibility, that hospitals waited for up to 11 months after the Dirigo fiscal year began to initiate such constraints only at the beginning of their 2004 fiscal years is a less realistic assumption, and is not consistent with what representatives of the hospitals were saying at the Hospital Study Commission meetings this past year. During the fall and winter of the second Dirigo fiscal year (July 2004 – June 2005), the Hospital Study Commission was meeting regularly to discuss, among other things, the *third* fiscal year CMAD limit and how it should be set. The MHA, as a member of those discussions, indicated that for Dirigo Year 2, hospitals had decided to raise their voluntary limit to 4.5%, and were already operating under that assumption.

Methodologies Involved in Calculating Baseline and 2004 Growth Rates

Hospital Market Basket Adjustment

In August, 2005, the Savings Offset Payment (SOP) Workgroup suggested that the SOP calculation should take into account Hospital Market Basket Inflation (HMBI). The HMBI reflects the rate of inflation for hospital input costs nationally – e.g., salaries and wages, benefits, labor, utilities, supplies, pharmaceuticals, liability insurance. It is determined by consultants to the CMS for purposes of determining updates to the Medicare Prospective Payment System. Since the annual HMBI is stated as though hospital fiscal years correspond to the federal fiscal year (October 1 through September 30), the annual HMBI had to be adjusted (using the quarterly data published by CMS that make up the HMBI) to match the Dirigo Fiscal Year of July 1- June 30. This resulted in annual HMBI of 4.2% in 2001, 3.1% in 2002, 3.5% in 2003, and 3.8% in 2004.

Compound Growth Rate in Excess of Inflation

A second adjustment to the growth rate calculation suggested by the SOP Workgroup was to use compound rather than average growth rates over the baseline period 2001-2003. Thus, after inflation was taken out of cost growth over the baseline period, the baseline growth rate was the compound growth rate (CGR). The CGR is slightly lower than the average growth rate over 3 years. For example,

CMAD 2000 = \$4000

CMAD 2003 = \$4700 after taking out inflation-related growth

$$\begin{aligned}\text{Average Growth Rate} &= ((4700-4000)/4000)/3 \\ &= 5.83\%\end{aligned}$$

$$\text{Compound growth rate} = 5.52\%^1$$

Final SOP Methodology:

The methodology used to incorporate the HMBI and the CGR was to inflate each hospital's 2000 CMAD by the HMBI for the three years 2001-2003 to get an inflation-indexed CMAD for 2003. This inflation-indexed CMAD for 2003 was subtracted from 2003 actual CMAD; that difference represented the three-year (baseline) change in cost after adjusting for inflation. This numeric difference was used to calculate the compound rate of growth between 2000 and 2003 in excess of inflation. That compound growth rate became the "baseline growth rate".

¹ $4000 * 1.0552 * 1.0552 * 1.0552 = \4700

To calculate the inflation-adjusted rate of growth for 2004, the 2004 HMBI inflation rate of 3.8% was subtracted from the actual growth rate of CMAD in 2004 over CMAD in 2003.

The SOP was the product of the difference between baseline growth rate and the 2004 inflation-adjusted growth rate, times the 2003 CMAD; that product was then multiplied by the number of 2004 case-mix and outpatient-adjusted discharges.

Hospital example:

1. Hospital 2000 CMAD of \$4000
2. Inflated forward to 2003: $\$4000 * 1.042 * 1.031 * 1.035 = \$4,448$ (inflation-indexed 2003 CMAD)
3. Hospital 2003 actual CMAD = \$5,125
4. Difference between 2003 actual CMAD and the 2003 inflation indexed CMAD is \$677.
5. \$677 increase over 3 years = 5.35% compound baseline growth rate (the rate of growth in excess of inflation for the three years 2001-2003).
6. Hospital 2004 actual CMAD = \$5,304; this represents a 3.5% increase over 2003 actual CMAD (assumes hospital budgeted to hit the Dirigo CMAD target).
7. 2004 HMBI-adjusted growth rate is -.3% (actual 3.5% minus HMBI in 2004 of 3.8%)
8. Baseline inflation-adjusted growth rate of $(1 + 5.35\%) * 2003 \text{ actual CMAD} = \5399 , which is what 2004 CMAD would have been after inflation if it had grown at the baseline rate.
9. Inflation-adjusted growth rate is $(1 - .003) * 2003 \text{ actual CMAD}$ or \$5110 after adjusting for inflation.
10. Difference between \$5399 and \$5110 = \$289 which is the savings per discharge in 2004.
11. Multiply the savings per discharge times the number of casemix-and outpatient-adjusted discharges, say 7,000 discharges = SOP of \$2,023,000.

Table 2 shows the SOP by hospital, using the above methodology. The total SOP attributable to the CMAD voluntary limit for Dirigo Year 1 is roughly \$75 million, generated by 22 hospitals out of the 36 acute facilities in Maine.

Table 2
SOP related to CMAD Growth Limit

Hospital	Baseline CGR > HMBI	2004 Growth Rate > HMBI	SOP
AROO	-0.004	0.030467	\$0
BLHL	0.0178	-0.0388	\$522,327
BRDG	0.0091	-0.09058	\$1,487,122
CALA	0.0067	0.006852	\$0
CARY	-0.0136	0.032596	\$0
CMMC	0.0093	0.022227	\$0
DEAN	0.0107	0.100586	\$0
DNET	-0.0131	-0.03994	\$448,070
EMMC	0.0383	-0.02139	\$15,851,479
FRKL	0.0386	-0.05518	\$3,489,372
HGGD	0.0025	-0.05922	\$1,487,598
HLTN	-0.0223	-0.01974	\$0
INLD	0.0099	-0.08337	\$2,286,989
MECS	0.0349	0.07429	\$0
MGNL	0.0257	-0.0266	\$8,921,522
MMC	0.0216	0.008545	\$4,570,562
MAYO	0.0076	-0.07333	\$1,309,278
MRCY	0.0182	0.048158	\$0
MDCS	0.0275	-0.03799	\$3,468,018
MILES	0.0143	0.031798	\$0
MLNK	-0.0217	-0.00049	\$0
MDES	0.4172	0.035133	\$5,749,712
NMMC	0.0748	0.011678	\$1,343,575
PKVW	0.0184	0.032467	\$0
PBMC	0.0417	-0.00917	\$1,831,506
PVMC	0.1911	0.048233	\$1,560,611
RDFW	0.0685	-0.04855	\$3,616,655
RUMF	0.0646	-0.08716	\$2,180,813
SBCK	0.0265	0.171647	\$0
SMMC	0.0232	0.051809	\$0
STEV	0.1588	-0.08537	\$6,388,356
STAN	0.0821	0.033871	\$294,907
STJO	0.0095	-0.0589	\$4,249,608
STMY	0.0259	0.0217	\$336,984
WLDO	0.0356	0.105979	\$0
YORK	0.0355	-0.02814	\$3,587,724
SUM:			\$74,982,787

Appendix A: Adjustments to the cost and case mix data provided by MHA

MHA only provided hospital cost data for fiscal year 2003, using the Medicare Cost report Worksheet C, which excludes hospital bad debt and non-hospital expenses (home health agencies, longterm care facilities, hospital-owned physician practices). MHA also excluded the state provider tax in 2003, based on its records of hospital 2003 provider tax information. MHA used Worksheet C (part 1, column 1, line 103) for total hospital expenses, and then removed costs and revenues associated with Skilled Nursing Facilities, Nursing Facilities, and Other Longterm Care, as well as Rural Health Centers, using those specific line items in Worksheet C.

This same template was used by the consultant to construct hospital cost data for the years 2000, 2001, 2002, and 2004. 2004 was further adjusted to remove hospital-based physicians that had been external entities in 2003 (not included in the 2003 Medicare cost report) but had been consolidated into the hospital entity in 2004. These costs and revenues were identified primarily because of new cost centers with names like "Primary Care Physicians" in the MCR and/or huge jumps in existing "primary care" or "outpatient clinic" cost centers, where physician practice consolidation in 2004 could be identified through footnotes and supplemental cost and revenue information provided by hospital audited financial statements.

The 2004 hospital provider tax was also entered by the consultant, using information provided by the state regarding the amounts due and the timing of the tax levy. Combining the state information with that provided in hospital 2003 and 2004 audited financial statements, as well as the MHA information for 2003, the consultant was able to match tax levies to hospital fiscal year. For instance, for hospitals with fiscal years ending September 30, the 2003 levy (announced in November of 2003) was not recognized until hospital fiscal year 2004; for those hospitals, they recognized the 2003 full levy plus a proportionate share of the 2004 levy in 2004. Proportionate share was based on the overlap in hospital and state fiscal years, so for the September 30 hospitals, that overlap was 75% or 9 months.

The MHA used Worksheet C for all hospitals except Maine Medical Center (MMC) and Eastern Maine Medical Center (EMMC); for those two, it started with expenses from Worksheet A, which included more expenses than did Worksheet C (including educational and research expenses). While MHA then removed the educational and research expenses to arrive at a 2003 CMAD for these two hospitals, their CMADs were still higher than what would have been derived from Worksheet C's hospital expenses. It was not clear what rationale was behind using Worksheet A for these two hospitals, so the consultant used the Worksheet C data instead for EMMC and MMC, in order to maintain consistency.

Finally, the consultant had to estimate the all-discharge Case Mix Index (CMI) including newborns for 2000, because it was not possible to get that number in time for this analysis. We did have the 2000 CMI excluding newborns, so the CMI including

newborns was estimated using the average relationship of the CMI including Newborns to the CMI excluding newborns for the years 2001, 2003, and 2004, years for which both CMIs were available. (This same method was used to fill in the CMI for 2002)

Final Report to DHA SOP: Voluntary Operating Profit Limit

Nancy M. Kane, DBA
Consultant to Dirigo Health Agency
September 15, 2005

According to the Dirigo Act, Section F-1, under “Voluntary limits to control growth of insurance and health care costs”, “each hospitalis asked to voluntarily hold hospital consolidated operating margins to no more than 3% for the hospital’s fiscal year beginning July 1, 2003 and ending June 30, 2004.”

The legislation does not define what entity “hospital consolidated operating margins” should encompass. The Maine Hospital Association’s (MHA) position is that the entity should be whatever entity prepares audited financial statements. However this position leaves considerable room for ambiguity because some hospitals file audited financials at the hospital, hospital plus subsidiary, and parent health system levels. Nor does the legislation define “operating margin”. The MHA’s position is that operating margin is whatever a hospital reports as its operating income (operating revenue minus operating expense), divided by operating revenue. However hospitals vary in how they define operating revenues; in particular, investment income (interest, dividends, realized gains) may be considered operating or nonoperating revenue depending on the hospital. Other types of income such as gifts and equity investments in other operating entities (particularly physician practices) may be reported as operating or nonoperating income.

A final refinement required to comply with the language of the law is to match hospital fiscal years to the July 1 to June 30 fiscal year specified. Only ten hospitals’ fiscal years directly match this “State Fiscal Year” or SFY. Five more hospitals’ fiscal years begin 1-3 months before July 1, and 21 hospitals’ fiscal years begin 3 – 6 months after July 1. Table 1 shows how operating revenue, expense, and income were weighted by hospital fiscal year to achieve compliance with the SFY:

TABLE 1

2004 Hospital FY Begins:	4/1/2003	5/1/2003	6/1/2003	7/1/2003 (State FY)	10/1/2003	1/1/2004
# Hospitals	2	2	1	10	13	8
# Months overlap with Dirigo FY 2004	9	10	11	12	9	6
Weighting scheme applied to hospital FY CMAD to match Dirigo FY*	.75*2004 +.25*2005	.83*2004+ .17*2005	.92*2004 +.08*2005	=2004	.25*2003 +.75*2004	.5*2003 +.5*2004

*2005 not yet available, so the SOP was calculated using only a partial year

This report describes hospital operating margins with investment income, gifts, and equity investments excluded, in order to standardize the definition of operating income across hospitals in Maine. It reports the 2004 and "baseline" operating margin for hospital-entity-alone, and hospitals plus subsidiaries. The average operating margin over the prior three years (2001-2003) is the "baseline" operating margin. To get to a savings offset payment (SOP), the following rules are followed:

1. If the baseline margin is above 3%
2. And if the 2004 operating margin is below the baseline margin
3. Then a "savings offset payment" (SOP) is calculated as the difference in operating income between the baseline margin applied to 2004 operating revenue, and the actual operating income in 2004. ¹

Results are shown in the two tables that follow. Table 2 shows SOP using hospital-only as the reporting entity; Table 3 shows the SOP using hospital plus subsidiary consolidated operating margins.

¹ The SOP calculation is (Baseline Margin * 2004 Total Operating Revenue) – 2004 Operating Income.

TABLE 2

Hospital Entity Only 2004 Operating Margins and Baseline Margins, SFY- Adjusted

	Baseline Margin	Operating Margin 2004	Savings Offset Pay (\$ 000)	Reason for no SOP
BLHL	-0.05189	-0.02105	0	(1) & (2)
BRDG	0.098383	0.039025	1344.572	
CALA	0.058312	0.07016	0	2
CARY	-0.01258	0.041437	0	(1) & (2)
CMMC	0.043789	0.008296	6216.621	
DEAN	-0.1666	-0.0844	0	(1) & (2)
DNET	-0.02018	0.006306	0	(1) & (2)
EMMC	0.032214	0.028172	1407.758	
FRKL	0.017096	0.060963	0	2
HGGD	0.004786	-0.00666	0	1
HLTN	-0.01641	-0.03893	0	1
INLD	0.039028	0.036345	83.70115	
MAYO	0.054323	0.068734	0	2
MDCS	0.06702	0.040782	1737.867	
MDES	0.008855	0.01734	0	(1) & (2)
MECS	0.02103	0.023155	0	(1) & (2)
MGNL	0.034166	0.047994	0	2
MILES	-0.01863	0.012327	0	(1) & (2)
MLNK	0.012773	0.065144	0	(1) & (2)
MMC	0.033502	0.045513	0	2
MRCY	-0.02174	0.015571	0	(1) & (2)
NMMC	0.010378	0.061385	0	(1) & (2)
PBMC	0.010097	0.011709	0	(1) & (2)
PBKY	0.022894	-0.00355	0	1
PKVW	-0.02093	-0.0264	0	1
RDFW	-0.00625	0.027625	0	(1) & (2)
RUMF	0.049846	0.098376	0	2
SBVY	0.054686	0.036919	303.9024	
SMMC	-0.00048	0.005279	0	(1) & (2)
STAN	-0.06287	-0.11542	0	1
STEV	0.057495	0.019428	1046.83	
STJO	0.027779	0.012744	0	1
STMY	0.093718	0.016235	7335.675	
TAMC	0.065373	0.024572	2715.286	
WLDO	0.007871	0.007188	0	1
YORK	0.029531	0.038199	0	(1) & (2)
TOTAL			22192.21	

REASONS FOR NO SOP:

- (1) BASELINE MARGIN LESS THAN 3%
- (2) 2004 MARGIN GREATER THAN BASELINE

Table 2 shows a potential savings offset payment attributable to the voluntary operating profit limit of \$22.192 million, due to the fact that nine hospitals earned 2004 operating margins below baseline margins (2001-2003 average operating margins), and those baseline margins were above 3%.

Nineteen hospitals had baseline margins below 3%, so the voluntary "limit" was not limiting to them. Of those 19, 14 earned 2004 operating margins *above* their baseline margins, reporting 2004 operating margins as high as 6.5%.

An additional six hospitals had baseline margins above 3%, but their 2004 operating margins were still higher than that – as high as 9.8%.

It is pretty clear from this analysis that many hospitals did not feel profit constraints at the hospital entity level due to the voluntary profit limit of 3% in the Dirigo Act. Even among the nine hospitals that did earn 2004 operating profits below baseline levels, only 5 earned 2004 operating profits at or below 3%; the other four earned 2004 operating profits between 3.6 and 4.0%.

Table 3

Hospital plus Subsidiary Entity 2004 Operating Margins and Baseline Margins, SFY-Adjusted

Hospital & Subsidiary:	2004		SOP
	OpMarg	baseline	
BLHL	-0.02105	-0.05189	0
BRDG	0.039066	0.030105	0
CALA	0.070131	0.06363	0
CARY	same as hospital		0
CMMC	0.021443	0.023083	0
DEAN	same as hospital		0
DNET	same as hospital		0
EMMC	0.028229	0.049583	7444.55
FRKL	0.073992	0.02737	0
HGGD	same as hospital		0
HLTN	-0.03867	0.01465	0
INLD	0.013249	*	*
MAYO	0.068734	0.028053	0
MDCS	0.033107	0.045465	971.2104
MDES	-0.01249	-0.03822	0
MECS	0.023291	0.018942	0
MGNL	0.025982	0.014829	0
MILES	-0.02043	-0.04467	0
MLNK	0.019642	-0.10263	0
MMC	0.030921	0.019266	0
MRCY	0.015571	-0.02222	0
NMMC	0.061452	0.010765	0
PBMC	same as hospital		0
PBVY	-0.01053	-0.00563	0
PKVW	-0.02694	-0.02255	0
RDFW	0.027254	-0.00624	0
RUMF	0.093328	0.01369	0
SBVY	0.036919	0.05933	470.1251
SMMC	0.006168	-0.00287	0
STAN	-0.11599	-0.06496	0
STEV	0.011342	-0.01436	0
STJO	0.012744	0.020326	0
STMY	0.005901	0.017024	0
TAMC	0.00808	*	*
WLDO	-0.0033	0.003272	0
YORK	0.038199	0.029702	0
SUM			8885.885

* hospital plus subsidiary income statement not available in one of the three baseline years, which affected two SFY years, so baseline average could not be calculated. When not SFY-adjusted, however, and using only the two baseline years available on a hospital fiscal-year basis, Inland generated a \$1.1 million SOP, while TAMC generated no SOP.

Table 3 provides baseline average margins and 2004 operating margins for the same hospitals; in this table, the margins reflect the consolidated operations of hospitals plus subsidiaries. For most hospitals, consolidation with subsidiaries lowers operating margins in both the baseline and 2004 periods. Some hospitals do not have subsidiaries, so their margins remain the same as in Table 2.

Consolidation with subsidiaries has the effect of eliminating much of the potential SOP generated on a hospital-entity-only basis. The aggregate potential SOP for hospitals consolidated with subsidiaries dropped to \$8.8 million (hospital plus subsidiaries), less than one-third of what was generated by hospital entities alone. Only three of the nine hospitals from Table 1 showed potential offset savings payments once the operating income of subsidiaries is consolidated with that of hospitals (although for two of those nine, consolidated data was not available for one of the baseline years, so no SOP could be calculated).

Discussion

These results illustrate how critical it is to both define the entity for which operating margins are to be limited, and to set a limit that is meaningful relative to historical experience. Depending on which entity is considered as the unit for which operating margins are reported, savings offset payments could be anywhere from \$8.8 to \$22 million. The MHA definition of a "consolidated" entity being anything for which audited financials are prepared does not provide sufficient guidance to policymakers.

The voluntary operating limit does not appear to have been a real constraint on hospital profits. A clearer definition of the reporting entity and a more stringent level of operating profit constraint are needed if this type of limit is to generate meaningful savings offset payments in the future.