

**REVIEW AND COMMENTS
REGARDING
THE CLEVERLEY & ASSOCIATES REPORT
ENTITLED
“DAYTON AREA HOSPITAL CHARGE &
COST INDEXES”
MAY 31, 2006**

**Jack C. Keane
November 26, 2006**

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The purpose of this report is to provide the Greater Dayton Area Hospital Association (GDAHA) with an assessment of the report entitled Dayton Area Hospital Charge and Cost Indexes (the Cleverley report) that was prepared for and submitted to the GDAHA by Cleverley and Associates on May 31, 2006. As agreed by the GDAHA, the aim of my review has been to determine whether the cost assessments and related conclusions that are presented in the Cleverley report are based on reliable, pertinent data and on reasonable technical and conceptual methodologies. In particular, my focus has been to identify and provide comments about any aspects of the report that would be relevant to employers and other purchasers of health care services in the Dayton market.

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FINDINGS IN BRIEF

In general, I believe that the Cleverley report is an excellent study that uses the most recent, publicly available data; applies a relatively sophisticated methodology to adjust for differences in hospital input costs and services; and draws reasonable conclusions regarding the levels of hospital charges and costs in Dayton compared to those in similar Ohio communities, in Indianapolis, and the U.S. average.

In summary, the Cleverley report finds that the Dayton hospitals have overall Medicare costs that are approximately 2% below the U.S. Median and overall Medicare charges that are approximately 5% above the U.S. Median. If somewhat different wage adjustments are applied, the overall Medicare costs of the Dayton hospitals appear to be 1% to 4% below the U.S. Median while their overall charges appear to be 3% to 6% above the U.S. Median.

The Cleverley report is based on Medicare costs and charges. It does not examine total costs or charges or, more specifically, private sector costs or charges. Examination of these other cost and charge areas would have required information that is not typically available to the public and was not available to Cleverley and Associates. Total costs, total charges, and private sector costs and charges tend to be correlated with Medicare-based comparisons. Therefore, the Cleverley and Associates report may be considered to be evidence of the probable level of these other cost and charge measures without actually establishing them. However, the most recent data available from the American Hospital Association suggest that Dayton's overall hospital costs may be approximately 13% above the U.S. average.

Finally, the Cleverley and Associates report was designed to measure and compare costs and charges rather than payments. Payments are the "costs" that are most relevant to insurers and self-insured purchasers of health care services. Additional information would need to be obtained and analyzed before firm conclusions could be drawn regarding the relative level of total payments and, more important, private sector payments in Dayton or in other communities.



BASIC INFORMATION AND CONSIDERATIONS

A. Background

The Cleverley report presents comparative hospital charge and cost data for hospitals located in the following markets:

- o Dayton
- o Columbus
- o Cincinnati
- o Toledo
- o Indianapolis

In addition, data are presented that represent the U.S. Median across all communities.

B. Sources of Data

The Cleverley report uses publicly available data from the Centers for Medicare and Medicaid Services (CMS) as the basis of its hospital cost comparisons. These data come from a variety of sources including the MedPAR file, which is an electronic file of all Medicare inpatient discharges that provides information for each case including the associated diagnosis related group (DRG), the billed charges, the length of stay and Medicare's payment; the HCRIS file, which contains Medicare Cost Report information, including costs and charges by revenue department, for each hospital; and the Outpatient PPS file, which provides claim-level details including charges, Medicare payments and estimated costs for each hospital.

The reliance on Medicare data imposes some limitations on the conclusions that can be directly drawn from the Cleverley and Associates study. As will be discussed below, information about total costs and charges or private sector costs and charges was not available to Cleverley and Associates. Therefore, they could not directly measure or compare the levels of total costs or charges, private sector costs or charges, or payments across the communities. While it is possible to extrapolate from the results of this study based on observations that have been made in other situations where additional data were available, it is important to recognize that those observations may not hold true for the Dayton market. These caveats are more fully addressed in subsequent sections of this assessment.

C. Key Adjustments

1. Adjusting for Casemix

The most difficult task in producing meaningful indices of hospital costs and charges is to define hospital services (i.e., outputs) in a consistent way that takes into account the differences in the level of resources (i.e., inputs) required to produce those services. Hospitals vary considerably in the types of patients they treat on inpatient and outpatient bases and these patients require different kinds and amounts of resources such as nursing time, operating room time, lab tests, radiology exams, drugs and other care. A hospital that treats a relatively high proportion of patients who need complex services (e.g., coronary bypass surgery) will have higher costs than a hospital that primarily treats patients with less complex requirements such as those associated with normal maternity care. Most hospitals provide a mix of relatively complex and non-complex care and it is important to reflect each hospital's "casemix" in a consistent way when costs (and charges) are being compared across facilities.

2. Adjusting for Wage Levels

In addition to casemix, which reflects the resource requirements of hospital patients, there are other factors that drive hospital costs that are considered to be outside the management control of individual hospitals. The most important of these drivers is the level of wages that prevails in a particular hospital market relative to the level of such wages in other markets. In general, hospitals that are located in markets that have high overall wage levels will have to pay more to attract and keep employees than will hospitals that are located in markets that have low wage levels. In effect, hospitals compete—with each other, with other health care firms (such as nursing homes) and with non-health care companies—to obtain the employees (especially the skilled employees) they need to provide services to their patients. If a hospital is located in a market with a relatively high overall cost of living, it will need to pay more for labor than will a hospital that is located in an area with a low cost of living. Obviously, some hospitals use their employees more efficiently and productively than do other hospitals. These differences in efficiency result in cost differences that should be identified by well-designed cost analyses. Such analyses screen out the effects of differences in cost of living levels and wage rates across markets and compare hospital costs after systemic labor cost differences have been excluded from the data.

As discussed below, the Cleverley report took both casemix and prevailing wage levels into account in its assessment of the level of Medicare costs and charges in Dayton, in the other communities that were included in the study, and in the U.S.

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THE HOSPITAL CHARGE AND COST INDEXES: METHODOLOGIES AND RELATED COMMENTS

The Cleverley report addresses the two issues discussed above—namely, differences in casemix and local wage levels—by making adjustments for these factors before comparing hospital costs across the various markets identified above. The “Hospital Charge and Cost Indexes” presented in the Cleverley report are computed and presented separately for charge and cost levels, and for inpatient and outpatient services, and the inpatient and outpatient values are merged into overall cost and charge indices for each community.

A. Inpatient Services

The inpatient cost (and charge) indices that are presented in the Cleverley report contain the following key adjustments of the raw data:

1. Adjustments for Casemix Effects

In the Cleverley report, the inpatient output is measured as casemix-adjusted cases. Specifically, the Medicare cases treated by each hospital in each community were weighted by their relative resource requirements using the Medicare DRG weights as the scale for valuing the individual cases. The DRG weights reflect Medicare's best efforts to date to reflect the resource requirements of different kinds of patients in its inpatient payment methodology. The weighted cases were aggregated for each community to yield the total inpatient output of the hospitals that were included for each community.

2. Comments Regarding the Casemix Adjustment

The method used in the Cleverley report to measure inpatient hospital outputs is reasonable and renders the analysis more useful than it would have been if had assumed that the casemix intensity levels of the various communities were equal. It is likely that the differences in casemix across the communities were not substantial but the use of casemix-adjusted cases removes the doubt that would have existed if unadjusted cases had been used in the study. Although the study could have applied a more sophisticated DRG grouper (e.g., the APR-DRG grouper) to the inpatient data, this step would have substantially raised the cost of the study and is unlikely to have resulted in significant changes in its results.

3. Adjustment for Wage Levels

The Cleverley report adjusts the inpatient costs (and charges) by using the wage indices published by CMS for each of the communities. The CMS wage indices reflect the prevailing level of wages in each community relative to the national standard. Wage indices above 1.0000 indicate that the area has relatively high wages whereas wage indices below 1.0000 indicate that the area has relatively low wages. The Cleverley report applied the CMS wage indices for 2004 because the data used in the study were drawn from 2004. The overall effect of applying the wage index was to raise the level of Dayton's costs (and charges) by about 5%, relative to the U.S. Median, because the wage index for Dayton for FFY 2004 was approximately 5% below the average wage index for the U.S. Thus, the application of the wage adjustments had the effect of making the Dayton hospitals look slightly worse in the comparisons than they would have looked without a wage adjustment.

4. Comments Regarding the Wage Adjustments

Table 1 shows the CMS Wage Index values for FFY 2007 and for three previous years for each of the specific communities as published by CMS in the Federal Register. The Cleverley report applied the FFY 2004 wage adjustments because the data used in their study were from 2004. The data used by CMS for the calculation of wage adjustments for any given rate year are based on wage information that is drawn from time periods that usually pre-date the rate period by several years. The wage indices for FFY 2007 are based on previous data periods that are closer to being contemporaneous with the 2004 cost and charge data that were used in the Cleverley report.

The Cleverley report applied the wage indices to all costs, including capital and supplies costs, whereas it would have been better to apply the wage indices to only that portion—approximately 68%—that is affected by differences in local wage levels. Therefore, I have adjusted the cost and charge comparisons in the tables that are presented in subsequent sections of this review to reflect the application of the wage indices to only the labor portion of costs. This adjustment has the effect of reducing the impact of the wage adjustments and thereby improves the position of the hospitals in any community, relative to the U.S. Median, in any year in which their wage index value is below the U.S. wage index value.

Table 1 also shows that the absolute values and the relative level of the wage indexes do not change dramatically for the individual communities and across the communities over the years. Therefore, the results of the hospital charge and cost analyses presented in the Cleverley report are not predicated on widely fluctuating indices that could skew the findings for any given year. The stability of the wage indices over time strengthens the conclusions presented in the Cleverley report.

Table 1: Comparison of Wage Indices and Geographic Adjustment Factors (GAFs) Across Communities by Federal Fiscal Year (FFY)

	FFY 2007 FINAL	FFY 2006 FINAL	FFY 2005 FINAL	FFY 2004 FINAL
COMMUNITY	WAGE INDEX	WAGE INDEX	WAGE INDEX	WAGE INDEX
DAYTON	0.9185	0.9060	0.9227	0.9529
CINCINNATI	0.9522	0.9595	0.9574	0.9413
COLUMBUS	1.0076	0.9857	0.9751	0.9648
INDIANAPOLIS	0.9769	0.9912	1.0033	0.9916
TOLEDO	0.9455	0.9564	0.9514	0.9397

B. Outpatient Services

The wage adjustments discussed above in regard to inpatient services also apply to outpatient services. In addition, as with inpatient services, it is essential when comparing hospital outpatient costs and charges to adjust for differences in the mix of services that were provided. The Cleverley report adjusts for wage differences and for differences in the mix of services in its examination of outpatient costs and charges.

Specifically, the Cleverley report adjusts for the different mixes of outpatient services that were provided by the hospitals by applying a set of relative weights that are based on the weights that are assigned to the various “Ambulatory Patient Categories” (APCs) and the associated fee schedules that are used to pay for those services that are not covered by the APCs under the Medicare outpatient prospective payment system. The result is an excellent weighted measure of hospital outpatient services (outputs) that takes into account the differences in outpatient service mixes. In addition, the Cleverley report applies the same wage indices to the outpatient charge and cost analyses that were used for the inpatient analyses. This approach is consistent with the approach used by CMS for Medicare and is the best available method of adjusting for differences in wage levels across hospital markets subject to the minor adjustments in methodology that were discussed above.

C. Payer Mix Effects

In addition to casemix and wage levels, there are other “external” factors that can affect hospital cost and charge levels. The Cleverley report presents information concerning one of the most important of these items—namely, payer mix. Specifically, the mix of patients varies across hospitals with respect to their financial responsibility. Some hospitals have a high percentage of low income patients who may be covered by insurance (i.e., Medicaid) or who have no coverage whereas other hospitals are located in more affluent areas and treat very few Medicaid or uninsured patients. Medicaid tends to be the lowest or among the lowest payers. Persons who are not insured usually cannot afford to pay all or a large portion of the costs of their treatment. Hospitals that treat large numbers of Medicaid or uninsured patients typically have to raise their charges in an attempt to generate funds to cover the financial shortfalls that are generated by these patients.

The Cleverley report presents valuable information regarding the proportion of Medicaid, Medicare, Disproportionate Share and Non-Government days at the hospitals in the various communities that were included in the study and in the U.S. This information is helpful as background for the interpretation of the Hospital Cost and Charge Indexes. Without this information, the indexes could be viewed as potentially biased by payer mix differences across the

communities. The supplemental information largely removes that possible concern.

Specifically, as shown in Table 2 (which consolidates the information from the Cleverley report), the proportion of Medicaid patients (13.09%) is lower in Dayton than it is in any of the other communities and it is lower than the U.S. Average. This fact reduces the need for the Dayton hospitals to raise their charges to subsidize Medicaid shortfalls. At the same time, the Dayton hospitals have a higher percentage of patients covered by Medicare (which usually makes payments that are above Medicaid but below the level of payments made by private insurers) than do the hospitals in any of the other communities but their percentage of Medicare patients is lower than is typical in the U.S. The percentage of Non-Government patients, who are usually the highest paying patients (assuming that they are not uninsured), is slightly lower in Dayton than in the other selected communities even though it is substantially above the U.S. average. Finally, the percentage of "DSH" patients (who include Medicaid patients and low income Medicare beneficiaries) in Dayton (13.75%) is in the middle of the distribution for the selected communities and substantially higher than the U.S. average.

Table 2: Payer Mix Information for the Hospitals in Dayton and Elsewhere

COMMUNITY	MCAID DAYS %	MCARE DAYS %	DSH %	NON-GOVT DAYS %
DAYTON	13.09	48.78	13.75	38.12
CINCINNATI	14.53	45.95	12.42	39.52
COLUMBUS	15.32	42.86	11.35	41.82
INDIANAPOLIS	15.41	44.64	16.17	39.96
TOLEDO	18.88	41.55	17.18	39.58
US AVERAGE	15.04	50.68	9.14	34.28

In my opinion, these data suggest that the payer environment in Dayton is not significantly different from (i.e., more or less favorable than) the payer environments in the other selected communities or in the U.S. on average. Therefore, it is reasonable to view the Hospital Charge and Cost Indexes as indicative of the performance of the Dayton hospitals with regard to Medicare costs and charges without further adjustments for payer mix.

D. Teaching Activities

One of the factors that is generally believed to be a significant driver of hospital costs is the level of teaching that is provided by the individual hospitals in a community. Teaching costs come in two forms: direct teaching costs, which include the salaries and wages of interns and residents and faculty members, as well as other direct program costs; and indirect teaching costs, which are a reflection of unmeasured, sub-DRG casemix differences and the higher costs that are generated by the need for interns and residents to do more tests, perform more examinations, and pursue some unlikely but possible diagnoses or causes of disease. In general, the more teaching a hospital does, the higher its costs will be, although the effects are “non-linear” in that the impact on costs tends to increase in percentage terms faster than the percentage increase in interns and residents in the upper echelons of the teaching spectrum. Medicare (and many Medicaid programs) recognizes the impact of teaching on hospital costs by paying higher rates to teaching hospitals. Private sector health plans usually do not include a formulaic adjustment for teaching but they usually pay more to teaching hospitals than they do to non-teaching hospitals for the same services.

The level of teaching was not included as a factor to be explored when the Cleverley and Associates report was commissioned. Therefore, it did not provide any information regarding this factor. In order to determine whether differences in teaching levels across the selected communities might have substantially affected the results of the study, I obtained some relevant CMS information and performed some comparisons.

Specifically, I extracted information from the CMS inpatient hospital “Payment Impact File” for FFY 2007 regarding the number of beds and the number of interns and residents per bed for the hospitals that were included in the Cleverley report. (I was not able to obtain information for seven of the sixty-two hospitals in the study: Dearborn County Hospital and St. Luke Hospital West in Cincinnati; James Cancer Hospital and Doctors Hospital in Columbus; Fulton County Health Center in Toledo; and Winona Memorial Hospital and Wishard Memorial Hospital in Indianapolis). I computed the level of interns and residents per bed by community by totaling the number of residents and dividing by the total number of beds. Medicare uses the “Interns and Residents Per Bed” value as its measure of the teaching levels of hospitals and ties its “indirect medical education” payments to this measure under the DRG payment system.

Table 3: Information Regarding Teaching Levels in the Selected Communities

COMMUNITY	INTERNS AND RESIDENTS PER BED
DAYTON	0.1335
CINCINNATI	0.2564
COLUMBUS	0.1627
INDIANAPOLIS	0.1721
TOLEDO	0.1623

As shown in Table 3, Dayton has the lowest level of teaching of any of the selected communities, although its level of teaching is not dramatically lower than the teaching level elsewhere except in Cincinnati where the University of Cincinnati Hospital substantially raises the community average. Overall, the modestly lower level of teaching in Dayton would be expected to have a small effect on its costs—i.e., all other things being equal, we would expect Dayton's costs (and charges) to be slightly lower than those in the other communities with higher teaching loads.

In the course of my review of the Cleverley and Associates report, I talked and communicated by e-mail with Jamie Cleverley who was very helpful in providing me with additional information and explanations of their methods. We discussed the teaching issue and he told me that teaching had not been one of the variables that had been included in the study design. He told me that his experience has been that teaching activities tend to have significant impacts on costs only at the major teaching hospitals. He e-mailed me the following supplementary information regarding the impact of teaching on hospital costs:

Table 4: Information Received From Cleverley and Associates Regarding the Impact of Teaching Levels on Hospital Costs

TYPE OF HOSPITAL	HOSPITAL COST INDEX MEDIAN VALUES
NON-TEACHING	101.15
LOW INTENSITY TEACHING	100.12
MEDIUM INTENSITY TEACHING	100.68
HIGH INTENSITY TEACHING	111.83

Thus, based on the experience of Cleverley and Associates, and consistent with my comments at the beginning of this section, the impact of teaching appears to be primarily associated with its effects in major teaching hospitals. Columbus, Cincinnati and Indianapolis contain high intensity teaching hospitals so their costs may have been driven up slightly relative to those of Dayton. However, the effects are not likely to have been dramatic because, as shown in Table 3, the average teaching level in Dayton—which takes into account all teaching activities, including high intensity teaching—was only a few percentage points lower than the level of teaching in Columbus, Toledo and Indianapolis. Only when Dayton is compared with Cincinnati could it be said that the impact of teaching on the relative levels of costs was likely to have been significant.

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KEY FINDINGS OF THE CLEVERLEY REPORT

The purpose of making the various adjustments that were discussed above was to produce hospital charge and cost measures that can be compared across hospital markets in a reasonable way. The Cleverley report presents the following results.

A. Inpatient Findings

After making the adjustments for casemix and wage levels, the Cleverley report compares the level of charges and costs in Dayton to the level of charges and costs in the other communities. As shown in Table 5, the Cleverley report finds that hospital inpatient costs per casemix-adjusted Medicare case are 9.4% above the U.S. Median but are lower than in all of the other identified communities. The Cleverley report finds that hospital inpatient charges per casemix-adjusted Medicare case in Dayton are 13.1% above the U.S. Median but they are in the middle of the range of charges compared to all of the other selected communities. Interestingly, all of the communities shown have high inpatient costs and high inpatient charges, except for Toledo, which has high inpatient costs and slightly below average inpatient charges.

Table 5: Hospital Inpatient Cost and Charge Indexes by Community As Presented in the Cleverley Report

COMMUNITY	INPATIENT COST INDEX	INPATIENT CHARGE INDEX
DAYTON	109.43	113.13
CINCINNATI	110.65	105.63
COLUMBUS	119.96	114.76
INDIANAPOLIS	115.90	138.86
TOLEDO	114.08	99.50
US MEDIAN	100.00	100.00

As discussed above, it arguably would have been better to have applied a more contemporaneous wage index to 68% (i.e., the labor portion) of cost rather than to have applied the FFY 2004 wage indices to 100% of cost. Table 6 presents the results of using the former approach to adjust the inpatient cost indices by community.

Table 6: Adjusted Hospital Inpatient Cost Indices

COMMUNITY	INPATIENT COST INDEX	ADJSTD TO REMOVE FFY 2004 WAGE INDEX AT 100%	ADJSTD TO REFLECT FFY 2004 WAGE ADJUST TO 68% OF COST	ADJSTD TO REFLECT FFY 2007 WAGE ADJUST TO 68% OF COST	FFY 2007 WAGE INDEX	FFY 2004 WAGE INDEX
DAYTON	109.43	104.28	107.78	110.57	0.9185	0.9529
CINCINNATI	110.65	104.15	108.57	107.71	0.9522	0.9413
COLUMBUS	119.96	115.74	118.61	115.14	1.0076	0.9648
INDIANAPOLIS	115.90	114.93	115.59	116.77	0.9769	0.9916
TOLEDO	114.08	107.20	111.88	111.40	0.9455	0.9397
US MEDIAN	100.00	100.00	100.00	100.00	1.0000	1.0000

As shown, the relative position of the Dayton hospitals improves slightly (from 109.43 to 107.78) if the FFY 2004 wage index is applied to 68% of cost

rather than to 100% of cost. If the FFY 2007 wage indices are used, instead of the FFY 2004 wage indices, and if they are applied to 68% of cost, the relative position of the Dayton hospitals worsens slightly (from 109.43 to 110.57). These calculations indicate that the relative position of the Dayton hospitals is fairly impervious to the nuances of technical methods and largely corroborates the basic finding reported in the Cleverley report. Specifically, regardless of which methods are used, the inpatient costs of the Dayton hospitals appear to be from 8-11% above the U.S. Median.

As shown in Table 7 below, the effects on the relative charge position of the Dayton hospitals of applying the FFY 2007 wage indices, rather than the FFY 2004 wage indices, to 68% of charges rather than to 100% of charges are similar to the effects of making such changes with respect to costs. Specifically, if the FFY 2004 wage index is applied to 68% of charges, rather than to 100%, the relative position of the Dayton hospitals improves slightly (from 113.13 to 111.42). If the FFY 2007 wage index is used, the position of the Dayton hospitals worsens slightly (from 113.13 to 114.31). Accordingly, the inpatient charges of the Dayton hospitals appear to be from 11 to 14% above the U.S. median, depending on which technical method is used.

Table 7: Adjusted Inpatient Charge Indices

		ADJSTD TO REMOVE FFY 2004 WAGE INDEX AT 100%	ADJSTD TO REFLECT FFY 2004 WAGE ADJST APPLIED TO 68% OF CHARGES	ADJSTD TO REFLECT FFY 2007 WAGE ADJST APPLIED TO 68% OF COST	FFY 2007 WAGE INDEX	FFY 2004 WAGE INDEX
COMMUNITY	INPATIENT CHARGE INDEX					
DAYTON	113.13	107.80	111.42	114.31	0.9185	0.9529
CINCINNATI	105.63	99.43	103.65	102.82	0.9522	0.9413
COLUMBUS	114.76	110.72	113.47	110.15	1.0076	0.9648
INDIANAPOLIS	138.86	137.69	138.49	139.91	0.9769	0.9916
TOLEDO	99.50	93.50	97.58	97.16	0.9455	0.9397
US MEDIAN	100.00	100.00	100.00	100.00	100.00	100.00

In sum, these results show a high degree of consistency. Depending on the technical methods used, the inpatient costs of the Dayton hospitals appear to be from 8-11% above the U.S. Median and their inpatient charges appear to be from 11-14% above the U.S. Median. The importance of the fact that the

inpatient charges of the Dayton hospitals are higher than their inpatient costs, relative to the U.S. Median, is diminished by the fact that a small percentage of inpatient payments are made on the basis of charges.

B. Outpatient Findings

As shown in Table 8 below, which reports the outpatient comparisons presented in the Cleverley report, Dayton's outpatient costs are substantially lower than the costs in all of the other selected communities. In addition, they are 13% below the U.S. Median. Outpatient charges in Dayton are slightly above the U.S. Median while they are in the middle of the range for the other selected communities.

Table 8: Hospital Outpatient Cost and Charge Indexes by Community

COMMUNITY	OUTPATIENT COST INDEX	OUTPATIENT CHARGE INDEX
DAYTON	86.77	100.47
CINCINNATI	92.21	95.45
COLUMBUS	95.17	107.42
INDIANAPOLIS	100.95	87.78
TOLEDO	98.68	107.70
US MEDIAN	100.00	100.00

As discussed above, in regard to inpatient services, the comparisons shown in Table 8 reflect the application of the FFY 2004 wage indices to 100% rather than 68% of charges. Table 9 shows the effects of applying the FFY 2004 wage index to 68% of cost and of applying the FFY 2007 wage index to 68% of cost. Specifically, if the FFY 2004 wage index is used, the relative outpatient cost position of the Dayton hospitals improves slightly from 87% of the U.S. Median to 85% of the U.S. Median. If the FFY 2007 wage index is used, the relative outpatient position of the Dayton hospitals worsens slightly from 87% to 88% of the U.S. Median.

Table 9: Adjusted Outpatient (OPD) Cost Indices

COMMUNITY	OPD COST INDEX	ADJSTD TO REMOVE FFY 2004 WAGE INDEX AT 100%	ADJSTD TO REFLECT FFY 2004 WAGE ADJST APPLIED TO 68% OF COST	ADJSTD TO REFLECT FFY 2007 WAGE ADJST APPLIED TO 68% OF COST	FFY 2007 WAGE INDEX	FFY 2004 WAGE INDEX
DAYTON	86.77	82.68	85.46	87.67	0.9185	0.9529
CINCINNATI	92.21	86.80	90.48	89.76	0.9522	0.9413
COLUMBUS	95.17	91.82	94.10	91.35	1.0076	0.9648
INDIANAPOLIS	100.95	100.10	100.68	101.71	0.9769	0.9916
TOLEDO	98.68	92.73	96.78	96.36	0.9455	0.9397
US MEDIAN	100.00	100.00	100.00	100.00	1.0000	1.0000

Thus, regardless of what adjustments are made, the outpatient costs of the Dayton hospitals are substantially below the U.S. Median.

Table 10 shows the effects of applying the wage adjustments discussed above to outpatient charges rather than costs.

Table 10: Adjusted Outpatient (OPD) Charge Indices

COMMUNITY	OPD CHARGE INDEX	ADJSTD TO REMOVE FFY 2004 WAGE INDEX AT 100%	ADJSTD TO REFLECT FFY 2004 WAGE ADJST APPLIED TO 68% OF CHARGES	ADJSTD TO REFLECT FFY 2007 WAGE ADJST APPLIED TO 68% OF CHARGES	FFY 2007 WAGE INDEX	FFY 2004 WAGE INDEX
DAYTON	100.47	95.74	98.96	101.51	0.9185	0.9529
CINCINNATI	95.45	89.85	93.66	92.91	0.9522	0.9413
COLUMBUS	107.42	103.64	106.21	103.11	1.0076	0.9648
INDIANAPOLIS	87.78	87.04	87.54	88.44	0.9769	0.9916
TOLEDO	107.70	101.21	105.62	105.17	0.9455	0.9397
US MEDIAN	100.00	100.00	100.00	100.00	1.0000	1.0000

As shown in Table 10, the application of the FFY 2004 wage index to 68% of outpatient charges has the effect of improving the relative outpatient charge position of the Dayton hospitals from less than 1% above to approximately 1% below the U.S. Median. The application of the FFY 2007 wage index has the effect of bringing the relative outpatient charge position of the Dayton hospitals to 1.5% above the U.S. Median.

In sum, the outpatient costs of the Dayton hospitals are substantially below the U.S. Median whereas their charges are approximately equal to the U.S. Median. This difference in relative position implies that the mark-up of outpatient charges over outpatient costs is approximately 15% higher than the average mark-up elsewhere in the U.S. The outpatient charge position of the Dayton hospitals is more important than their inpatient charge position because most inpatient payments are made on the basis of fixed rates whereas a significant proportion of outpatient payments is tied to charges.

C. Overall Findings

As shown in Table 11, the overall level of Medicare costs in the Dayton hospitals, as presented in the Cleverley report, is 3.7% to 9.6% lower than in any of the other communities and it is slightly lower than the U.S. Median. The overall level of Medicare charges in Dayton is in the middle of the other communities but it is 4.6% above the U.S. Median.

**Table 11: Overall Hospital Cost and Charge Indexes
By Community**

COMMUNITY	OVERALL COST INDEX	OVERALL CHARGE INDEX
DAYTON	99.97	108.06
CINCINNATI	103.74	102.42
COLUMBUS	109.62	112.35
INDIANAPOLIS	107.34	94.91
TOLEDO	109.57	127.60
US MEDIAN	102.26	103.28

The overall position of the Dayton hospitals on costs and charges is subject to the same adjustments that were made above for inpatient and outpatient services. The adjusted overall cost position is shown in Table 12.

Table 12: Adjusted Overall Cost Index

COMMUNITY	OVERALL COST INDEX	ADJSTD TO REMOVE FFY 2004 WAGE INDEX AT 100%	ADJSTD TO REFLECT FFY 2004 WAGE ADJUST APPLIED TO 68% OF COST	ADJSTD TO REFLECT FFY 2007 WAGE ADJUST APPLIED TO 68% OF COST	FFY 2007 WAGE INDEX	FFY 2004 WAGE INDEX
DAYTON	99.97	95.26	98.46	101.01	0.9185	0.9529
CINCINNATI	103.74	97.65	101.79	100.98	0.9522	0.9413
COLUMBUS	109.62	105.76	108.39	105.22	1.0076	0.9648
INDIANAPOLIS	107.34	106.44	107.05	108.15	0.9769	0.9916
TOLEDO	109.57	102.96	107.46	107.00	0.9455	0.9397
US MEDIAN	102.26	102.26	102.26	102.26	102.26	102.26

As shown above, the overall costs of the Dayton hospitals are between nearly 4% below ($98.46/102.26 = .9628$) to approximately 1% below ($101.01/102.26 = .9878$) the U.S. Median depending on which technical adjustments are used.

Table 14: Adjusted Overall Charge Indices

COMMUNITY	OVERALL CHARGE INDEX	ADJSTD TO REMOVE FFY 2004 WAGE INDEX AT 100%	ADJSTD TO REFLECT FFY 2004 WAGE ADJUST APPLIED TO 68% OF CHARGES	ADJSTD TO REFLECT FFY 2007 WAGE ADJUST APPLIED TO 68% OF CHARGES	FFY 2007 WAGE INDEX	FFY 2004 WAGE INDEX
DAYTON	108.06	102.97	106.43	109.18	0.9185	0.9529
CINCINNATI	102.42	96.41	100.50	99.70	0.9522	0.9413
COLUMBUS	112.35	108.40	111.08	107.84	1.0076	0.9648
INDIANAPOLIS	94.91	94.11	94.65	95.63	0.9769	0.9916
TOLEDO	127.60	119.91	125.14	124.61	0.9455	0.9397
US MEDIAN	103.28	103.28	103.28	103.28	1.0000	1.0000

On an overall basis, the charges of the Dayton hospitals are between 3% and 5.7% above the U.S. Median.

D. Summary

Thus, Medicare costs appear to be approximately average to slightly below average whereas Medicare charges appear to be high by approximately 3% to 6%. These differences are small, they are not significantly affected by the method used to adjust for wage indices, and they are not likely to have been substantially skewed by either the payer mix characteristics or by the teaching differences that were discussed in previous sections of this report.

5

ADDITIONAL DISCUSSION

A. Reliance on Medicare Costs and Charges

As noted above, the Cleverley report relies on Medicare experience as the basis for its conclusions about the level of hospital costs and charges in Dayton. The primary reason for this dependency is the absence of a reliable, readily accessible source of hospital cost, charge and casemix data for the non-Medicare patient population. Cleverley and Associates has found in other studies where they did have access to data for non-Medicare payers that hospital performance in total across all payers tended to mirror their performance for Medicare. This is an entirely plausible observation but it is suggestive rather than demonstrative regarding the level of total costs and charges in the Dayton market. Specifically, the fact that the relative level of Medicare costs and charges tends to be reflective of overall costs and charges does not mean that this observation necessarily holds true for Dayton. Moreover, the relative level of Medicare costs and charges, or of total costs and charges, is not necessarily reflective of the costs and charges associated with private sector patients.

The Cleverley report does a commendable job of establishing the level of Medicare costs and charges in the Dayton hospitals. As discussed above, it is reasonable to conclude, based on the results of the index comparisons that are contained in the Cleverley report, that Dayton's hospital costs are slightly below U.S. Median, and lower than the costs in any of the other communities; whereas Dayton's hospital charges are about 3% to 6% above the

U.S. Median and in the middle of the range for the other communities. The small and offsetting differences in the payer mixes across the communities do not strike me as necessarily helping or hurting the Dayton hospitals with respect to their ability to achieve the national average level of costs or charges. In sum, it is reasonable to view Dayton's Medicare costs as average and its charges as slightly high but not materially different from those in the other communities and in the nation given the imperfect ability to correct and adjust for all relevant variables.

The lack of non-Medicare data prevented Cleverley and Associates from directly examining either total costs and charges or private sector costs and charges. If it is assumed that Dayton's overall costs and charges are approximately average, then its private sector costs and charges are likely to also be approximately average—specifically, if its total charges and costs are average, and its Medicare costs and charges are approximately average, then the remainder—which would consist primarily of private sector patients at most hospitals—would have to be approximately average. Unfortunately, there is no direct evidence on the record regarding the level of Dayton's overall costs and charges.

B. Data from the American Hospital Association (AHA)

In order to examine the question of whether Dayton's overall costs are average, I used the only data source that was reasonably available to me that includes total cost data. Specifically, I examined Table 8 of the AHA publication Hospital Statistics (2007 Edition)—which contains data for 2005—and produced the following comparisons.

Table 15: Comparison of Total Costs (All Payers) Per Adjusted Admission from AHA Hospital Statistics (2007 Edition): 2005 Data

COMMUNITY	COST PER ADJUSTED ADMISSION (ADJSTD ADM)	REL TO NATL AVG W/O WAGE ADJST	WAGE INDEX FFY 2007	ADJSTD TO REFLECT FFY 2007 WAGE ADJST APPLIED TO 68% OF COST	REL TO U.S. AVG
DAYTON	\$9,116	1.07	0.9185	\$9,666	1.13
CINCINNATI	\$8,825	1.03	0.9522	\$9,126	1.07
COLUMBUS	\$9,413	1.10	1.0076	\$9,365	1.10
INDIANAPOLIS	\$10,491	1.23	0.9769	\$10,660	1.25
TOLEDO	\$9,661	1.13	0.9455	\$10,040	1.18
US. AVERAGE	\$8,535	1.00	1.0000	\$8,535	1.00

These data indicate that Dayton, and all of the selected communities, have total costs per adjusted admission (a statistic that takes into account inpatient and outpatient activities) that are substantially above the national average—i.e., 3% to 23% without a wage adjustment and 7 to 25% with a wage adjustment. These comparisons make no adjustments for casemix or payer differences across the communities and are subject to question for these and other reasons including the imperfections of the adjusted admission statistic that is used by the AHA. Casemix is not likely to differ significantly across the communities or in relation to the U.S. However, the different results that come from use of the AHA data for all patients, rather than only Medicare patients, illustrate the precarious nature of extrapolating from one study to another when addressing the subject of hospital costs.

C. Physician Practice Patterns: Implications for Cost Levels By Payer

It has been observed that physician practice style consistency is one reason to expect Medicare cost and charge levels to be indicative of overall hospital cost and charge levels. Specifically, physicians usually treat their patients alike and their resource consumption patterns—which drive hospital costs—are therefore likely to be similar regardless of which payer covers a particular patient. This observation has some general validity but it is not necessarily true in any particular situation. Moreover, it is important to remember that physicians may not be aware of the payment methodology that applies to a particular patient when they are using hospital resources but hospitals are certainly aware of the different payment methods and their implications for profitability.

For example, hospitals operate under a variety of financial incentives for inpatient hospital services. Medicare pays on a DRG per case basis that encourages short lengths of stay and efficient use of ancillary services during the hospital stay. Many private sector plans pay on a per diem basis that encourages longer stays while rewarding efficient use of ancillaries on a per day basis. Hospitals that reduce their Medicare lengths of stay save money and increase their profitability because shorter stays do not generally trigger reductions in Medicare payments. However, hospitals that reduce their private sector lengths of stay are penalized financially if they are paid on a per diem basis because they lose all of the revenue associated with the days that are eliminated whereas they can only eliminate a portion of the associated costs. It cannot be assumed that hospitals with efficient resource consumption patterns for Medicare necessarily have efficient resource consumption patterns across all payers

Specifically, hospitals in some markets are currently approaching the health plans that pay on a per diem basis and beseeching them to switch to DRG per case reimbursement methods. The hospitals see an opportunity to

accommodate the growing demand for inpatient care with the same number of beds by reducing their private sector lengths of stay. In these situations, the hospitals are identifying private sector lengths of stay as being longer than necessary and are asking to be converted to DRG per case systems so that they can free up beds to meet the burgeoning demand for hospital inpatient services. The hospitals do not see the same opportunity to reduce Medicare stays because they have been focused on managing Medicare stays since the advent of the Medicare DRG system in 1983. Thus, in some markets at least, hospitals may have average or below average Medicare costs but higher than average private sector costs because the financial incentives that govern payments to the hospitals are sometimes very different depending on which payer is covering the patient. In Dayton, it is possible that the relative level of total hospital costs and charges, and private sector costs and charges, is higher (or lower) than the level reported for Medicare costs and charges.

D. Costs and Charges vs. Payments

The Cleverley report examined Medicare costs and charges rather than payments. The Medicare program pays hospitals largely without reference to costs and charges except for outlier payments. Its payments are driven by formulas that are mostly based on casemix, teaching levels, disproportionate share levels and other hospital characteristics rather than on either costs or charges.

In the private sector, hospital payments are driven by the terms of the contracts that have been negotiated between health insurers and the hospitals. In many markets, private insurers pay hospitals for inpatient services on the basis of negotiated per diem or per case rates that can be above or below cost by significant amounts. "Cost" to an insurer or self-funded employer is different from "cost" to a hospital. For the hospital, cost is the expense of treating patients. For the payer, cost is the amount that it had to pay the hospital, and this amount is often only loosely related to the hospital's costs.

As discussed above, the Cleverley report was focused on costs and charges rather than on payments. It is reasonable to conclude from the Cleverley report that the Medicare cost level in Dayton is not substantially different from U.S. Median and that it is within the range of the other communities whereas the Medicare charge level in Dayton is modestly above the U.S. Average and within the range of the other communities. But these observations do not bring with them any guarantee that private costs or charges, or the rates that are being paid to the Dayton hospitals by the private insurers, are not substantially higher or lower than the overall costs, charges or payment levels in the other communities. Cleverley and Associates could perform a comparison of Medicare's hospital payments and the underlying costs associated with treating these patients. With additional data, they could also perform a study of total costs and total charges, and of private sector costs, charges and payments.

C. Larger Issues

The question of whether Dayton's hospital costs, charges or payments are higher or lower than the regional or national norms is an important starting point for discussions among providers and payers regarding the affordability of the health care system. The Cleverley report provides very useful information regarding Medicare costs and charges and some indications of the probable relative position of total costs and charges. However, in some ways, these regional and national benchmarks are outmoded as performance targets because the problem of affordability is intertwined with issues of quality and access that are national in scope and looming larger with each passing year. Currently, Medicare is facing the prospect of bankruptcy in the next decade, the number of uninsured persons has increased by 16% over the last four years, the ability of American firms to compete in worldwide markets is diminished by retiree health care cost burdens, wage increases have been stifled by health cost growth, physicians are facing fee cuts in real dollar terms, Americans are estimated to be receiving approximately 50% of the types of care that experts agree are most valuable in maintaining or improving health levels, the share of GDP that we devote to health care exceeds the average of the other economically developed countries by nearly 80%, even though our health system is arguably far from the best, and providers are still paid on financial bases that reward utilization rather than effectiveness in promoting individual and community health status.

In my opinion, the greatest share of the responsibility for this predicament should be assigned to the insurers and purchasers of health care services, rather than to the providers, because the payers create the payment structures that establish the financial incentives for the providers. In general, individuals and organizations respond to the incentives that are placed before them. The health care system today is a reflection of the incentives that have been embedded in the fee-for-service payment apparatus that has controlled the health care environment for at least fifty years. Providers have assiduously responded to that system by providing more and more care without necessarily considering the marginal costs and opportunity tradeoffs that were associated with the delivery of additional services. In addition, providers and health care consumers resisted and ultimately defeated most of the price and utilization controls that were instituted by managed care as a constraint on expenditure growth. In combination, these forces have created a system in which U.S. medians are an increasingly unsustainable standard.

The looming financial shortfall in Medicare and the growing number of persons without insurance are threats to the economic viability of providers and payers if they continue to with outmoded payment methodologies that reward volume rather than effectiveness. Payers are beginning to implement new programs, such as P4P, that may help to address the overall accountability

problem, but providers and payers will need to find new and vastly better ways to fund the health care system if they want to ensure their own futures and serve the interests of their communities.

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