

The Effect of the Prospective Payment System on Home Health Quality of Care

A comparison of overall outcomes pre-PPS (1999) and under the PPS (2002)

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by

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Executive Summary

Background

Since the implementation of the home health prospective payment system (PPS) on October 1, 2000, there has been both industry and federal interest in the impact of this change in reimbursement policy on the quality of care delivered by home health agencies. In particular, the Medicare Payment Advisory Commission (MedPAC) has expressed interest in comparing the overall quality of care provided by agencies prior to the implementation of PPS to the overall quality of care provided under the current system.

Method

In an effort to compare the overall quality of care provided in pre-PPS and PPS eras, a single measure of overall home health quality, referred to as a standardized quality index (SQI), was developed. This method incorporates twenty different quality outcome measures that have already been established for their utility in judging home health quality. In addition, it discounts the SQI based on whether patients experienced unplanned care events while on home health service.

Analysis

The method was applied to OASIS data submitted to CMS for 1999 and data submitted for 2002 to calculate a SQI for each time period. The SQI derived from the 1999 data provides an overall quality measure for care provided prior to the implementation of PPS. The SQI derived from the 2002 data provides an overall quality measure for care provided after the implementation of PPS. Additional analyses were conducted for each individual measure used to calculate the SQI scores. This involved comparing the admission status of patients during 1999 and 2002, calculating average scores for the individual items, and breaking out the percent of patients improved or declined for each measure.

Findings

There appears to be little difference in the overall quality of care provided by the home health industry in the pre-PPS and PPS eras. If anything, it would appear there has been a slight increase in overall quality as the 1999 average SQI was 0.6328 and the 2002 average SQI was 0.6843. This slight up-tick is also evident when comparing the SQI of different percentiles between the two timeframes.

More detailed analyses of the individual measures used to calculate the SQI scores indicate that there was little difference in the percent of patients that improved, had no change, or declined for each measure between the two time frames.

Discussion

Using a single measure of overall quality of care, such as an SQI, can facilitate analyses and discussions regarding overall quality of care provided by the home health industry. In particular, a single measure allows studies that seek to cross reference quality of care with other issues of concern in the home health industry, such as profitability and staffing. A single measure, however, provides only a general or "high level" insight into changes in quality. More detailed analyses of the individual measures used to calculate a single measure can provide additional insight.

Background

From 1990 to 1997, Medicare expenditures for home health services increased three times faster than spending for the program as a whole¹. In addition, during this period, there was dramatic growth in the use of home health services evidenced by a near doubling of the percentage of Medicare beneficiaries receiving home health care and a jump from 36 to 73 in the annual number of home health visits². Concerns regarding the skyrocketing Medicare costs associated with this rapid growth prompted Congress to enact legislation that replaced Medicare's fee-for-service payment system to home health agencies with a more restrictive prospective payment system (PPS). Specifically, in accordance with the Balanced Budget Act of 1997 (BBA), an interim payment system was instituted in October 1997 that applied reimbursement caps to the fee-for service system. This system was then replaced by the current PPS in October 2000.

Under PPS, home health agencies receive a single payment for each 60-day episode of care for a Medicare beneficiary. To determine base payments, Medicare requires home health agencies, as a condition of participation, to collect and submit data using a standardized assessment tool called the Outcome and Assessment Information Set (OASIS)³ on all their patients. They use select data items from the OASIS that capture a patient's anticipated therapy needs and other characteristics that can affect service use to calculate a base payment. This base payment is then adjusted for differences in labor costs across geographic areas.

Select data items collected in OASIS assessments are also used by Medicare to evaluate the quality of care provided by Medicare-certified home health agencies. Medicare calculates for each agency what percentage of their patients improved, stabilized, or declined on a series of functional activities referred to as outcome measures. For instance, Medicare calculates what percent of patients have improved in their ability to dress themselves, move about without pain, or manage their own oral medications. In addition to calculating agency specific outcomes, Medicare also uses OASIS data to calculate national and state benchmarks for each outcome measure to provide a frame of reference for use in analyzing agency outcomes. Agencies receive this information from CMS through outcome-based quality improvement (OBQI) reports or by accessing CMS's Home Health Compare web site.

¹ Source: GAO Report, Medicare Home Health Care, May 2002.

² Source: CMS Health Care Industry Market Update: Home Health, June 28, 2002.

³ OASIS was developed as a result of the Omnibus Budget Reconciliation Act of 1987 in which Congress mandated CMS to create a standardized patient assessment tool to assist in monitoring agency quality. In 1999, CMS began requiring home health agencies to collect and submit OASIS data on their patients.

Since the implementation of PPS, there has been both industry and federal interest in the impact of this change in reimbursement policy on the quality of care delivered by home health agencies. In particular, the Medicare Payment Advisory Commission (MedPAC) has expressed interest in comparing the overall quality of care provided by agencies prior to the implementation of PPS to the overall quality of care provided under the current system.

Currently, Medicare does not use a standardized measure of overall quality in home health care. Quality is typically measured by individual outcome measures leading to quality comparisons on specific measures, such as improvement in walking, rather than on an overall level. Theoretically, a single measure representative of overall quality in home health would be beneficial, rather than trying to balance the analysis of several individual outcome measures to understand overall quality of care. Using one measure could facilitate Medicare analyses that seek to compare the quality of different groups of home health agencies to each other or for during different timeframes. Furthermore, using a single measure could facilitate the interpretation of these findings for researchers as well as policy-makers.

Purpose

Given the potential benefits of a single measure of overall quality and an interest in investigating whether or not the implementation of the PPS has impacted the quality of care delivered by the home health industry, MedPAC contracted with Outcome Concept Systems, Inc. (OCS)⁴ for the following two purposes:

- 1) To create a method for calculating a standardized quality index (SQI) – a single measure that represents the overall quality of home health care at a national level
- 2) To compare the overall quality of home health care prior to the implementation of PPS to the level of quality under the current system

Methodology

A single measure of overall home health quality, referred to as a standardized quality index (SQI), was developed. This method incorporates twenty different quality outcome measures that have already been established for their utility in judging home health quality. In addition, it discounts the SQI calculation based on whether patients experienced unplanned care events while on home health service.

Outcome Measures

According to both the CMS-sponsored OBQI program and the CMS Home Health Compare web site, quality in the home health industry can be judged by how well an agency performs on a select set of outcome measures. These outcome measures are derived by looking at the change in a patient's health or functional status between two points in time. When calculating outcome measures for the home health industry, CMS and other organizations typically compare a patient's status at the time of discharge to that at the time of admission. This change in status is then used to reflect the quality of care delivered by the home health agency during that patient "case." For instance, upon discharge, improvement or stabilization in a patient's status on a specific measure can indicate that an agency is providing higher quality care than if a patient's status had declined during that case.

⁴ OCS is a pioneer in home health outcomes and benchmarking, providing clients with access to a national data warehouse benchmarking clinical, functional, visit utilization, and cost data to quantify and analyze the outcomes of home health services and the resources associated with achieving those outcomes

Publications by various research organizations, such as AHRQ^{5,6}, CHSPRC⁷, and CMS⁸, have suggested criteria by which to select outcome measures that effectively represent quality care in the home health industry. Most notably, these include the following two suggestions:

- 1) Home health outcome measures should capture changes in a patient's status that can be realistically impacted by home health services
- 2) Outcome measures should be calculated based on objective data

Based on CMS's use of the term outcome measure and the two criteria noted above, twenty outcome measures that can be calculated from OASIS data were selected and incorporated into the SQI methodology. These outcome measures are listed in **Table 1**.

Table 1.
Outcome Measures and Associated OASIS Data Field

M0-Number	Outcome Measure
M0420	Pain
M0464	Status of most problematic pressure ulcer
M0476	Status of most problematic stasis ulcer
M0488	Status of most problematic surgical wound
M0490	Dyspnea
M0530	Urinary Incontinence
M0540	Bowel Incontinence
M0570	Confusion
M0580	Anxiety
M0650	Upper body dressing
M0660	Lower body dressing
M0670	Bathing
M0680	Toileting
M0690	Transferring
M0700	Ambulation/locomotion
M0780	Management of oral medications
M0790	Management of inhalant medications
M0800	Management of injectable medications
M0810	Patient management of medical equipment
M0820	Caregiver management of medical equipment

⁵ Source: <http://www.cms.hhs.gov/quality/hhqi/HHQIAHRQ.pdf>, AHRQ Report on Home Health Quality Measures For CMS Public Reporting: Results of Technical Expert Panel Meeting and AHRQ Recommendations

⁶ Source: <http://www.qualityindicators.ahrq.gov/>

⁷ Source: Shaughnessy PW, Crisler KS, Schlenker RE, Arnold AG, Kramer AM, Powell MC, and Hittle DF, Measuring and Assuring the Quality of Home Health Care. Health Care Financing Review, 16, No. 1, 35-65.

⁸ Source: <http://www.cms.hhs.gov/medicaid/survey-cert/sc0313.pdf>, CMS Memorandum regarding Home Health Survey Protocol Enhancements, February 13, 2003

Unplanned Non-Home Health Care Services

In addition to helping patients maintain or improve their health status on certain objective measures, it has been suggested in AHRQ, CHSPRC, and CMS publications noted earlier that reducing or preventing further patient health problems while the patient is being cared for by home health also indicates that a patient has received quality care. In other words, when quality care is provided, the unplanned need for non-home health care services is prevented or avoided. It is recognized, however, that external services cannot always be avoided, indeed they are sometimes the result of appropriate care and not the result of inappropriate or inadequate care for the home health agency.

Given these suggestions, the SQI methodology incorporates some incidents of urgent or emergent care provided by non-home care providers in addition to outcome measures. Specifically, unplanned hospitalizations or emergent care events for the following four reasons were selected to be included in the SQI calculation:

- Injury caused by a fall or accident at home
- Wound infection, deteriorating wound status, new lesion/ulcer
- Improper medication administration, medication side effects, toxicity, anaphylaxis
- Hypo/Hyperglycemia, diabetes out of control

Unplanned hospitalizations and emergent care for these reasons can be considered “sentinel” as they raise concern about quality for CMS surveyors. In other words, home health agencies providing high quality care should be more effective at reducing or preventing hospitalizations or emergent care events for these specific reasons.

Standardized Quality Index (SQI)

Having established which outcome measures and which unplanned care events are incorporated into the SQI calculation, this section describes the steps involved in the calculation:

- For each of the twenty measures, the patient's start of care score for that measure is subtracted from the score at discharge
- Depending on whether the difference between the two scores is positive, negative, or there is no difference, a value is assigned to each patient case—The assignment of these values follows the logic that quality care is demonstrated by either improving or stabilizing a patient's status on these measures during their home health stay
 - When the patient's status improves, a value of +2 is assigned
 - When the patient's status declines, a value of -1 is assigned
 - When the patient's status stays the same, a value of +1 is assigned
 - When the data is missing, or the measure doesn't apply to the patient (for example, status of pressure ulcer for a patient with no pressure ulcers), a value of 0 is assigned
- For every instance of unplanned non-home health care experienced by a patient for one of the four pre-defined reasons during their stay on service, a -1 is also assigned
- The values assigned for outcome measures and unplanned care events are summed and divided by 20 to calculate an SQI value for each patient case
- The SQI value for each patient case is then summed and divided by the total number of cases, thus calculating the overall SQI for the group of interest

Limitations

The SQI methodology described above incorporates both outcome measures and unplanned care into a standardized quality index, theoretically capturing a broad range of quality indicators. A possible limitation to this approach is that it adds outcome measures and unplanned care events, which are dissimilar types of data. Specifically, the twenty outcome measures are based on start of care and discharge information while unplanned care (hospitalization or emergent care) are isolated events that occur at a point in time during the course of a patient's stay on service. The difference in data type raises some methodological questions. Should instances of unplanned care and outcome measures carry the same weight when being summed into an overall score? Can you add apples and oranges? Are these unplanned care events preventable? Should agencies be "dinged" for linking patients to needed care?

Pre-PPS SQI with PPS Home Health Quality

With a SQI methodology, it is now possible to discuss the method for comparing the overall quality of home health care prior to the implementation of PPS to the level of quality under the PPS system.

Case Selection

To make such a comparison, a SQI can be calculated for two groups of patient cases, one for cases receiving care prior to the implementation of PPS and one for cases receiving care after its implementation. With access to OASIS data for all Medicare and Medicaid patients cared for by Medicare-certified home health care agencies in 1999 and 2002 provided by MedPAC, cases were selected for each group based on the criteria listed in **Table 2**.

Table 2.

Case Selection Criteria

	Inclusion Criteria	Rationale
Pre-PPS Group	<ul style="list-style-type: none">• All Medicare and Medicaid cases that had both an admission assessment (Start of Care) and an end assessment (transfer or discharge) between August 1, 1999 and December 31, 1999	<ul style="list-style-type: none">• This captures cases prior to the implementation of PPS on October 1, 2000• The requirement to collect OASIS data was not implemented until July 19, 1999 and submission was not required for assessments collected prior to August 1.
PPS Group 1	<ul style="list-style-type: none">• All Medicare and Medicaid cases that had both an admission assessment (Start of Care) and an end assessment (transfer or discharge) between January 1, 2002 and December 31, 2002	<ul style="list-style-type: none">• This captures cases from the most recent timeframe for which data was made available
PPS Group 2	<ul style="list-style-type: none">• All Medicare and Medicaid cases that had both an admission assessment (Start of Care) and an end assessment (transfer or discharge) between August 1, 2002 and December 31, 2002	<ul style="list-style-type: none">• This captures cases from the most recent timeframe for which data was made available, matching the date restrictions of the pre-PPS group

Limitations of Case Selection

The approach to selecting the pre-PPS and PPS groups described above presents some limitations. By selecting only cases that have both start of care and discharge information within a given time frame, cases that were admitted during one time frame and discharged during the following time frame were excluded from analysis. As a result, the SQI scores ultimately calculated for the pre-PPS and PPS groups may not adequately reflect the quality of care provide to these types of patients—primarily those being cared for in winter weather months in the northern states and “snow birds” in the southern states. Unfortunately, due to the OASIS implementation timelines in 1999, the pre-PPS data set is further limited in that it only includes 5 months worth of data. This increases the impact of this limitation by eliminating more winter patients, all spring patients, and some summer patients.

Similarly, the method of case selection excludes many cases in which patients have longer-term stays. This limitation results in excluding every patient with a length of stay greater than a year in the PPS group 1 and every patient with a length of stay greater than 5 months in the pre-PPS group and PPS group 2.

By applying the same standards to the two data sets, the effect of these limitations is minimized in comparing the difference in quality between the two time frames.

Analysis

Pre-PPS and PPS Quality Comparisons

After selecting cases to represent the pre-PPS and PPS groups, the SQI methodology was applied to calculate a standardized quality index score for the cases of the pre-PPS and PPS groups. These scores were then compared. The findings are presented in the Findings section of this report.

Individual Outcome Measures and Unplanned Care Events

In addition to calculating SQI for the pre-PPS and PPS groups, a more detailed analysis was conducted for each individual outcome measure and for unplanned care events. This involved comparing the admission status of patients during 1999 and 2002, calculating average scores for the individual items, and breaking out the percent of patients improved or declined for each measure. These findings are presented in Appendix I.

Principle Findings

Table 3.
Average SQI for 1999 and 2002

	Pre-PPS Aug. – Dec. 1999	PPS-1 Full Year 2002	PPS-2 Aug. – Dec. 2002
Total Cases Used in Analysis	648,070	2,302,632	792,704
Average SQI	0.6328	0.6843	0.6840
Minimum SQI	-0.75	-1.00	-0.75
Maximum SQI	1.60	1.65	1.60
Median SQI	0.70	0.70	0.70
Standard Deviation	0.271152928	0.263270473	0.262374789
10th Percentile	0.3	0.4	0.4
20th Percentile	0.5	0.55	0.55
25th Percentile	0.55	0.6	0.6
30th Percentile	0.6	0.6	0.6
40th Percentile	0.65	0.65	0.65
50th Percentile	0.7	0.7	0.7
60th Percentile	0.7	0.75	0.75
70th Percentile	0.75	0.8	0.8
75th Percentile	0.8	0.85	0.85
80th Percentile	0.85	0.9	0.9
90th Percentile	0.9	0.95	0.95

Discussion and Concluding Remarks

Through development and use of a methodology for calculating a single measure of quality, an SQI, it appears that, in general, there is little difference in the overall quality of care provided by the home health industry in the pre-PPS and PPS eras. If anything, it would appear there has been a slight increase in overall quality as the 1999 average SQI was 0.6328 and the 2002 average SQI was 0.6843. This slight up-tick is also evident when comparing the SQI of different percentiles between the two timeframes. Furthermore, this trend appears to hold when comparing the median SQI for both timeframes, which in both instances is nearly identical to the average.

Although overall quality has apparently not declined, to a layperson this finding may not look very positive. Since +2 indicates improvement, +1 indicates no change, and -1 indicates decline for each measure, one might wonder whether an overall measure of quality of 0.6843 indicates that, on average, patients in 2002 experienced a slight decline. In other words, one might ask “Has overall quality stayed the same or somewhat improved since 1999, but, in general, this quality was not high to begin with as patients on average still did not improve by the time of discharge (+2 indicates improvement)?”

To further understand this finding and how overall quality may have changed between the pre-PPS and PPS eras, it is also important to examine 1) how many patients could improve or decline and 2) how many did improve, stay the same, or decline during these two timeframes. These findings are presented for the pre-PPS group and the PPS group 1 in Table 4 of Appendix 1. In addition, one can gain insight by understanding if there are differences in average start of care scores for each measure, between the two timeframes—were patients more functionally dependent or independent in 2002 as compared to 1999? These findings are presented for the pre-PPS group and the PPS group 1 in Table 5 of Appendix 1.

Using a method to calculate a single measure of overall quality of care, such as a SQI, can facilitate analyses and discussions regarding overall quality of care provided by the home health industry. In particular, a single measure can facilitate future analyses that seek to cross reference quality of care with other issues of concern in the home health industry, such as profitability and staffing. A single measure, however, provides only a general or “high level” insight into changes in quality. More detailed analyses of the individual measures used to calculate a single measure can provide additional insight.

Appendix I: Findings for Individual Outcome Measures and Unplanned Care Events

Table 4.

Percent Improved, Stayed the Same, and Declined for Individual Outcome Measures and Unplanned Care Events in 1999 and 2002

	Percent Improved = +2 points		Percent No Change = +1 points		Percent Declined = -1 points		Percent Not Applicable = 0 points	
	Aug.-Dec. 1999	Aug.-Dec. 2002	Aug.-Dec. 1999	Aug.-Dec. 2002	Aug.-Dec. 1999	Aug.-Dec. 2002	Aug.-Dec. 1999	Aug.-Dec. 2002
Pain	30.5%	34.7%	53.3%	52.3%	10.4%	8.8%		
Status of most problematic pressure ulcer	2.3%	3.0%	0.6%	0.8%	0.1%	0.1%	97.0%	96.1%
Status of most problematic stasis ulcer	1.1%	1.1%	0.3%	0.3%	0.1%	0.1%	98.5%	98.5%
Status of most problematic surgical wound	11.0%	17.0%	4.5%	7.2%	0.3%	0.5%	84.2%	75.3%
Dyspnea	27.7%	30.5%	53.7%	54.9%	12.9%	10.3%		
Urinary Incontinence	4.3%	4.9%	7.4%	11.8%	0.9%	1.1%	87.4%	82.2%
Bowel Incontinence	4.4%	5.0%	84.7%	86.2%	2.7%	2.6%		
Confusion	12.7%	14.4%	71.7%	72.0%	9.4%	8.9%		
Anxiety	17.7%	18.7%	63.5%	65.6%	12.3%	10.6%		
Upper body dressing	27.8%	31.4%	60.7%	59.4%	5.8%	4.8%		
Lower body dressing	32.2%	36.8%	56.1%	54.0%	5.9%	4.9%		
Bathing	41.8%	46.8%	42.5%	40.4%	9.9%	8.5%		
Toileting	15.7%	18.3%	74.6%	73.9%	3.9%	3.5%		
Transferring	26.2%	30.3%	61.4%	59.8%	6.6%	5.6%		
Ambulation/locomotion	24.3%	26.9%	63.8%	64.0%	6.1%	4.8%		
Management of oral medications	15.9%	17.1%	69.6%	71.0%	6.6%	6.1%	7.9%	5.9%
Management of inhalant medications	1.9%	2.0%	9.7%	10.7%	0.9%	0.8%	87.5%	86.5%
Management of injectable medications	1.3%	1.3%	6.5%	7.2%	0.5%	0.5%	91.8%	90.9%
Patient management of medical equipment	2.5%	2.5%	5.5%	5.8%	1.3%	1.2%	90.7%	90.5%
Caregiver management of medical equipment	1.4%	1.4%	4.7%	5.3%	0.9%	0.9%	93.0%	92.4%

	1 Event = -1 point		2 Events = -2 points		3 Events = -3 points		4 Events = -4 points	
	Aug.-Dec. 1999	Aug.-Dec. 2002	Aug.-Dec. 1999	Aug.-Dec. 2002	Aug.-Dec. 1999	Aug.-Dec. 2002	Aug.-Dec. 1999	Aug.-Dec. 2002
Emergent Care	5.2%	4.0%	0.2%	0.2%	0.01%	0.01%	0%	0%
Unplanned Hospitalization	5.1%	3.8%	0.2%	0.2%	0.02%	0.02%	0%	0%

Table 5.**Opportunity for Improvement/Decline in Individual Outcome Measures**

	Percent Could Improve		Percent Could Decline	
	Aug.-Dec. 1999	Aug.-Dec. 2002	Aug.-Dec. 1999	Aug.-Dec. 2002
Pain	57.3%	62.5%	92.8%	91.4%
Status of most problematic pressure ulcer	3.2%	3.9%	3.0%	3.5%
Status of most problematic stasis ulcer	1.7%	1.6%	1.3%	1.1%
Status of most problematic surgical wound	14.2%	22.3%	22.4%	29.4%
Dyspnea	57.7%	59.1%	97.8%	97.7%
Urinary Incontinence	13.3%	18.7%	6.8%	9.1%
Bowel Incontinence	8.0%	8.7%	97.0%	95.7%
Confusion	32.0%	37.2%	97.3%	97.4%
Anxiety	36.3%	37.8%	98.1%	98.5%
Upper body dressing	49.2%	52.9%	93.0%	93.6%
Lower body dressing	57.3%	62.5%	90.6%	90.4%
Bathing	78.3%	85.1%	94.5%	95.5%
Toileting	28.6%	32.1%	95.0%	95.3%
Transferring	52.1%	64.7%	98.4%	98.7%
Ambulation/locomotion	76.1%	82.6%	98.8%	99.1%
Management of oral medications	48.1%	50.8%	80.2%	78.9%
Management of inhalant medications	7.7%	8.0%	17.9%	17.1%
Management of injectable medications	8.4%	9.3%	8.9%	8.4%
Patient management of medical equipment	10.6%	10.6%	9.6%	9.2%
Caregiver management of medical equipment	4.9%	5.2%	10.2%	10.6%

Table 6.**Percent of Patients Who Did Improve/Decline of Those Who Could Improve/Decline**

	Percent of patients who did improve of those who could improve		Percent of patients who did decline of those who could decline	
	Aug.-Dec. 1999	Aug.-Dec. 2002	Aug.-Dec. 1999	Aug.-Dec. 2002
Pain	56.5%	57.9%	11.9%	10.0%
Status of most problematic pressure ulcer	79.4%	78.8%	4.1%	3.7%
Status of most problematic stasis ulcer	72.0%	71.8%	4.6%	4.5%
Status of most problematic surgical wound	82.6%	79.5%	1.6%	1.6%
Dyspnea	50.9%	54.0%	14.0%	11.0%
Urinary Incontinence	34.2%	27.7%	13.8%	12.3%
Bowel Incontinence	62.5%	60.3%	3.1%	2.8%
Confusion	42.2%	40.4%	10.2%	9.6%
Anxiety	51.6%	51.9%	13.3%	11.3%
Upper body dressing	59.9%	62.0%	6.6%	5.4%
Lower body dressing	59.6%	61.6%	6.9%	5.7%
Bathing	56.7%	57.4%	11.2%	9.3%
Toileting	58.4%	59.7%	4.3%	3.8%
Transferring	53.4%	49.0%	7.1%	5.9%
Ambulation/locomotion	33.9%	34.0%	6.6%	5.1%
Management of oral medications	35.1%	35.1%	8.7%	8.0%
Management of inhalant medications	26.7%	26.8%	5.3%	5.1%
Management of injectable medications	15.9%	15.1%	6.3%	6.6%
Patient management of medical equipment	25.5%	25.0%	9.5%	9.1%
Caregiver management of medical equipment	30.9%	28.4%	8.4%	7.8%