Looking Forward—Using Business Intelligence to Shape the Future of Your Business

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Background & Introduction

The use of data in the home health industry has expanded dramatically in the recent past. Five years ago, agencies tracked financial information almost exclusively for the purpose of reporting to the government. Today, the Prospective Payment System gives the home health industry reason to track and analyze reimbursement and expenses at a new level of detail. With a set payment provided based on patient characteristics rather than a variable reimbursement based on services performed, there is incentive to be conscious of providing care within a budget. Likewise, five years ago, clinical data varied from agency to agency and was stored in paper patient records in a filing cabinet. Today, the OASIS regulations require consistent clinical data to be stored in an easily accessible electronic format. This highly quality-focused market, with the public release of data on Home Health Compare and the new quality checks in the survey process, provides reason to tightly manage and improve the quality of care. These industry developments put performance in the spotlight, and agencies must respond by maximizing quality while minimizing resource use.

In this regulatory environment, internal and external benchmarking have become critical components of home health business operations. They provide the means to measure where an agency stands in terms of prior performance and as compared to the performance of their peers. It is now commonplace to see benchmarks being used to identify strengths and weaknesses, as well as to track any changes in performance over time. Each piece of information about an agency's operation provides valuable insight. Financial information is used to monitor profitability, net revenue, and operating expenses. Operational information is used to understand efficiency and staffing ratios. Clinical information is used to evaluate agency outcomes.

Yet as the use of home health data becomes even more ingrained in our industry, forward-thinking agencies will take two additional steps that will make this information even more valuable as a component of agency management:

1) They will cross-analyze these three distinct types of data—financial, operational and clinical—to gain a more comprehensive understanding of agency operations, and
2) They will use the information to shape the future of their organization in terms of both business development and improving the quality of care.

Cross-Analyzing Data: Business Intelligence

The information uncovered by cross-analyzing different types of data is commonly known in other industries as "business intelligence." The practice of integrating different types of information to gain new insight into business operations is an activity that has become popular over the past couple of decades in some of the most innovative and successful companies. Home health agencies are at a point where they have the information necessary to begin understanding how different parts of their businesses are inter-related and how they affect one another. Using this holistic approach to data analysis, agency executives can compile a collection of knowledge to use as the foundation of strategic decision-making. Herein lies the greatest power of information.

In a previous *Remington Report* article, "Benchmarking & Business Intelligence, Harnessing the Power of Information" (July 2003), we introduced the concept of business intelligence in the home health industry. In that article, we described a potential real-world scenario in which a fictitious agency used business intelligence to cross-analyze information in an effort to respond to a change in their local market. Specifically, the example described how Karen Timothy, the administrator of Home Health Agency, used benchmark data to prepare her organization for the likely influx of cardiac patients after the addition of a new Cardiac Center to Anytown Hospital, Home Health Agency's main referral source. Her preparations included cross-analyzing financial, operational, and clinical information to anticipate changes in service needs, reimbursement, and potential changes in quality outcomes.

While this illustration provides an example of how valuable the analysis of business intelligence can be, it is limited in that it described the *reactive* use of data given a changing environment. Business intelligence can and should also be used by home health agencies to *proactively* shape the future direction of their businesses. By analyzing what has been, agencies can anticipate what may be and make decisions about what they want the future of their organization to be.

Shaping the Future Direction of Your Business— Proactive Use of Data to Build Business

Business intelligence can help agencies shape the future direction of their home health businesses by enhancing the understanding of areas of clinical and financial strength, proven successes, and unrealized potential. Armed with insight into the market and a variety of data, agencies can proactively determine what areas of the business are best to build. This knowledge can lead to data driven decisions about refining or revamping organizational goals, constructing strategic plans for the future, and making plans into reality.

How does business intelligence play a role in shaping the future of a home health agency? It begins by enhancing the understanding of areas such as current patient population, referral volumes, strong outcomes, and profitable patient lines. By cross-analyzing financial, operational, and clinical information, an agency can answer questions such as:

- What specialty programs are successful for us in terms of quality outcomes?
- Which types of patients (by diagnosis) are profitable?
- Which have lower rates of rehospitalization?
- Which physician referrals fit best into our care model?

The answers to these types of questions can assist in determining the best direction for business development. The process of business development or enhancement may involve reassessing agency goals and making organizational, operational, or care changes accordingly. Activities it may involve include:

- Choosing to focus on increasing the number of referrals for specific diagnoses based on outcome-based success stories
- Targeting marketing communications to specific in-patient facilities or physicians
- Deciding to create or build specialty programs based on the discovery of a community need and
- Improving areas of unrealized potential to gain a competitive advantage

Shaping the Future of Your Business—Proactive Use of Data to Improve Quality Care

In addition to using business intelligence to help build their business, forward-thinking home health agencies will also use financial, operational, and clinical information to move beyond their current understanding of outcome-based quality improvement and quality management. With the power of business intelligence, these agencies will conduct cross-analyses to proactively identify operational and patient factors that are associated with specific outcomes of interest rather than focus solely on identifying the outcomes on which they perform well or not, as they have done in the past.

What is the impact of this type of proactive analysis? Why is it advantageous? By understanding what factors influence specific outcome measures, agencies are better equipped to improve their performance. The data helps them make decisions about resource allocations and provides a set of indicators by which they can "red flag" certain referrals when they have characteristics that have been associated with poor outcomes. Proactive use of data to improve quality of care therefore involves:

1) Selecting an outcome of interest
2) Hypothesizing what case characteristics or type of provider visit may influence this outcome

3) Testing this hypothesis using financial, operational, and/or clinical data, and
4) Using the findings to inform quality improvement and quality management efforts

Agencies that adopt this forward-thinking approach to quality improvement and quality management can also use data to help them assess whether their quality improvement interventions were effective.

Example: An agency determines that hospitalization for wound infection among cases with a primary diagnosis of chronic skin ulcer was higher for those receiving fewer skilled nursing visits than for those receiving more and was also higher for cases that were obese compared to those that were not. Based on their experience and these findings, they decided against immediately increasing the number of skilled nursing visits in favor of exploring the impact of providing periodic wound specialist consultations in conjunction with their current use of skilled nursing staff. They also created a system to "red flag" obese wound care referrals to indicate that they are at high risk for hospitalization. At some point after instituting these interventions, to determine if they were effective, this agency could then look to the data to see if there was a subsequent decrease in hospitalization for these cases. Similarly, they could look to the data again to see if these types of hospitalizations no longer varied by number of skilled nursing visits or the presence of obesity.

Shaping the Future of Your Business— A Data-Driven Example

To illustrate how business intelligence can be used to proactively shape the future direction of your home health agency, we offer the following example of cross-analyzing financial, operational, and clinical information based on a potential real-world scenario. As in our previous *Remington Report* article on business intelligence, we base our example on the fictitious agency – Home Health Agency –

in the community of Anytown. This example is designed to illustrate a potential approach to proactive business intelligence, rather than to provide an exhaustive "laundry-list" of all possible avenues of analysis.

In the past, as described earlier in this article, Home Health Agency's administrator, Karen Timothy, used the concept of business intelligence to respond to changes in the local market. Recently, however, Karen Timothy has left Home Health Agency. Mary Brown, an administrator interested in the proactive use of data, has replaced her.

During her initial weeks on the job, Mary Brown learns that Home Health Agency prides itself on delivering high quality CHF and wound-related care and has made a primary goal of obtaining these types of referrals. Prior to reassessing this and other agency goals in her efforts to develop a new strategic plan, Mary Brown wisely decides that she wants to better understand where the agency excels and where it does not in terms of quality and profit based on objective data.

Mary wants to focus on the most prominent subsets of patients cared for by the agency in order to identify and address the patients who have the biggest impact on the agency's finances, services, and outcomes. Furthermore, she is interested in learning about how Home Health Agency compares to competitors, not only in terms of overall outcomes but also in capturing market share and addressing the needs of the referral sources, the patients, their families, and the community. Mary begins her analysis by looking for the answers to the following questions:

1) What are the most common diagnoses cared for at Home Health Agency?
    - How does the list compare to the local market?
    - Which of these patients are profitable?
2) Which physicians' patients does Home Health Agency care for most often?
    - What diagnoses do they refer to Home Health Agency?
    - What types of services do they order?

3) Are there any opportunities for OBQI activities that would have a wide impact on the agency?
   - ♦ If so, what does the data tell us about possible ways to achieve OBQI goals?

Mary begins her analysis by looking at data regarding the organization's most common patients.

Table 1: Break out of Top 5 Primary Diagnoses at Home Health Agency

Primary Diagnosis		Percent of Patients	Skilled Nursing	HHA	Therapy	Total	Case Weight	Average Cost	Average Reimbursement	Average Net
428	Heart Failure	10%	9.7	5.1	4.2	19.2	1.0474	$2,191.86	$ 2,113.02	$ (78.83)
250	Diabetes	6%	15.7	6.0	3.7	25.7	1.2384	$2,972.37	$ 2,498.28	$ (474.09)
715	Osteoarthrosis	6%	4.3	3.0	9.2	16.5	1.3779	$1,849.38	$ 2,779.62	$ 930.24
707	Chronic Skin Ulcer	4%	19.3	6.4	3.1	29.0	1.3675	$3,371.04	$ 2,758.58	$ (612.46)
436	CVA	2%	6.4	6.0	12.6	25.3	1.7412	$2,797.00	$ 3,512.63	$ 715.63

With this simple breakdown, she learns that the most common diagnosis at Home Health Agency is Heart Failure, which is consistent with what she knows about the organization's goals to provide top quality CHF care and to seek referrals in this area. She also notes which of the top diagnoses are profitable (osteoarthrosis and CVA) or costly (diabetes and skin ulcers) for the agency.

To gain perspective on how this patient case mix compares to other organizations in the area, Mary compares Home Health Agency's list with the list of most common home care diagnoses in the state.

Table 2: Breakout of Top 5 Primary Diagnoses in the State

Primary Diagnosis		Percent of Patients
715	Osteoarthrosis	7%
428	Heart Failure	6%
436	CVA	5%
250	Diabetes	5%
707	Chronic Skin Ulcer	4%

This step of the analysis tells Mary that Home Health Agency's case mix is similar to that of the state, although they have a noticeably smaller percentage of CVA patients, a diagnosis that happens to have a higher reimbursement than cost for Home Health Agency.

Mary continues her investigation by looking at data by referring physician. She restricts this analysis to the eight primary physicians the agency works with.

Table 3: Analysis of Diagnosis and visits by referring physician

Name	Most common referral	Average visits per patient				
		Skilled Nursing	HHA	PT	OT	ST
Dr. Blume	707 - Chronic Skin Ulcers	11.6	7.4	2.2	1.0	0.8
Dr. Buffington	250 – Diabetes	12.2	9.2	6.2	0.7	0.0
Dr. Dean	436 – CVA	6.5	3.0	4.1	1.5	0.3
Dr. Diaz	250 – Diabetes	10.8	1.7	2.7	1.8	0.3
Dr. Evans	428 - Heart Failure	12.5	3.0	2.2	2.2	0.2
Dr. Lee	401 - Essential Hypertension	9.7	2.2	3.5	0.5	0.0
Dr. Siegel	414 - Heart Disease	7.6	2.6	2.8	0.0	0.0
Dr. Snyder	715 – Osteoarthrosis	10.5	11.4	10.4	3.6	0.4

Table 4: Analysis of Visits, Case Weight, and Financials by Referring Physician

Name	% of Admits	Total Visits	Case Weight	Average Cost	Average Reimbursement	Average Net
Dr. Blume	4%	23.1	1.5220	$2,602.13	$ 3,070.42	$ 468.29
Dr. Buffington	9%	28.4	1.0783	$3,176.36	$ 2,175.24	$(1,001.12)
Dr. Dean	10%	16.2	1.2060	$1,889.73	$ 2,432.87	$ 543.14
Dr. Diaz	6%	17.7	1.1947	$2,094.38	$ 2,410.14	$ 315.76
Dr. Evans	7%	20.1	0.9596	$2,346.93	$ 1,935.79	$ (411.14)
Dr. Lee	8%	15.9	1.3333	$1,843.83	$ 2,689.59	$ 845.76
Dr. Siegel	7%	13.2	1.1939	$1,516.67	$ 2,408.54	$ 891.88
Dr. Snyder	9%	36.9	1.6157	$4,110.83	$ 3,259.35	$ (851.48)

Mary notices that two of the physicians most commonly refer Diabetes patients, yet the care of Dr. Buffington's patients consistently costs more for Home Health Agency than the costs of caring for Dr. Diaz's patients. She also makes notes on the distribution of services ordered by each of the physicians to use in making future decisions about staffing ratios.

Now that she has a better understanding of the bulk of Home Health Agency's patients, both by diagnosis and by referring physician, Mary wants to know more about how Home Health Agency's outcomes compare to those of their peers. She chooses to look specifically at the outcomes most important in cases of caring for patients with CVA: the improvement and stabilization rates for activities of daily living.

Table 5: Analysis of CVA Patient outcomes, HHA vs. the state average

Measure Description		All of HHA's CVA Patients	State avg. for CVA Patients
M0640 - Grooming			
	Improved	61%	63%
	Stabilized	92%	92%
M0650 - Dressing Upper Body			
	Improved	59%	62%
	Stabilized	93%	91%
M0660 - Dressing Lower Body			
	Improved	58%	64%
	Stabilized	93%	94%
M0670 - Bathing			
	Improved	57%	61%
	Stabilized	89%	92%
M0680 - Toileting			
	Improved	60%	63%
	Stabilized	95%	95%

This data revealed that Home Health Agency was slightly below the state norms for this subset of patients. Mary thinks that this may provide a good opportunity for OBQI, especially given the volume of CVA referrals in the state.

After completing her analysis, Mary meets with the leadership at Home Health Agency to work through what the numbers mean and to list what actions the organization may want to take. A few meetings later, the group agrees to three primary goals for the next year:

1) To reduce the cost of caring for diabetic patients.
2) To increase the number of referrals of CVA patients.
3) To improve the functional outcomes of CVA patients (serves as an OBQI activity and a means to achieving goal #2).

To work towards achieving goal number one, the agency decides to research the orders, patient characteristics, and plans of care for the diabetic patients of Dr. Buffington and Dr. Diaz in order to understand why Dr. Buffington's patients are so much more costly to care for than Dr. Diaz's patients. To work towards achieving goal number two, the marketing department sets out to research sources for CVA referrals and determine what is important to those physicians and facilities about home care for CVA patients. With this information, they begin to create a strategic marketing plan around highlighting the outcomes of CVA patients cared for by Home Health Agency.

For goal number three, the Performance Improvement Coordinator, Leslie Shannon, conducted an analysis of the outcomes of CVA patients who received OT visits compared to those who didn't.

Table 6: Outcomes of CVA Patients receiving OT services compared to CVA Patients not receiving OT services

Measure Description		All CVA Patients	CVA w/ OT	CVA w/o OT
M0640 - Grooming				
	Improved	61%	62.9%	53.7%
	Stabilized	92%	92.0%	91.5%
M0650 - Dressing Upper Body				
	Improved	59%	60.3%	51.7%
	Stabilized	93%	93.0%	92.6%
M0660 - Dressing Lower Body				
	Improved	58%	59.2%	50.8%
	Stabilized	93%	95.1%	93.6%
M0670 - Bathing				
	Improved	57%	62.0%	51.2%
	Stabilized	89%	89.0%	90.5%
M0680 - Toileting				
	Improved	60%	60.4%	55.8%
	Stabilized	95%	95.5%	94.0%

Leslie's report showed that CVA patients who received OT visits consistently had better outcomes than those who did not receive OT. With this information, she constructed a plan to modify the distribution of services for future CVA patients.

Using data as the foundation for her decisions, Mary Brown has chosen to focus on three goals to proactively shape the future of Home Health Agency's business. These goals were selected because of their impact on Home Health Agency overall—not just one component of the business, and they were made with what is important to the patients, the referral sources, the community, and the agency in mind.

Conclusion

While the home health industry has become adept at using data and benchmarking as a tool to identify higher and lower performing outcomes, there is still more value to be found in the clinical, financial, and operational data available to individual organizations. By cross-referencing different types of data, agencies can gain a new level of insight into how their business operates. Furthermore, by looking for relationships between outcomes and patient characteristics and care provided, organizations can better focus quality improvement efforts.

Ultimately, the proactive use of data will help agencies use data about what has happened to anticipate what may happen in the future, and to make proactive decisions about the future of their organization.

About Outcome Concept Systems

Founded by a team of home care professionals, OCS has been providing home care organizations with performance improvement solutions since 1992. With over 1,200 clients spanning all 50 states, OCS maintains the nation's largest proprietary home health benchmark database comprised of clinical outcome and utilization information. OCS uses this information to provide the industry with education as well as products and services to guide decision-making and improve outcomes. Endorsed by trade associations throughout the country and recommended by major MIS vendors, OCS is the premier quality management vendor for home health, hospice, infusion, DME, and private duty organizations.

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