

East Tennessee State University
Digital Commons @ East Tennessee State University

Undergraduate Honors Theses

Student Works

5-2017

How Healthcare Accounting Adapts to Lean Practices

Caitlin R. Duke

East Tennessee State University

Follow this and additional works at: <https://dc.etsu.edu/honors>

 Part of the [Accounting Commons](#), and the [Health and Medical Administration Commons](#)

Recommended Citation

Duke, Caitlin R., "How Healthcare Accounting Adapts to Lean Practices" (2017). *Undergraduate Honors Theses*. Paper 388.
<https://dc.etsu.edu/honors/388>

This Honors Thesis - Open Access is brought to you for free and open access by the Student Works at Digital Commons @ East Tennessee State University. It has been accepted for inclusion in Undergraduate Honors Theses by an authorized administrator of Digital Commons @ East Tennessee State University. For more information, please contact digilib@etsu.edu.

How Healthcare Accounting Adapts to Lean Practices

By

Caitlin Duke

An Undergraduate Thesis Submitted in Partial Fulfillment of the

Requirements for the University Honors Scholars Program

East Tennessee State University

Caitlin Duke

Date

Dr. Gary Burkette, Thesis Mentor

Date

Mr. Joel Faidley, Reader

Date

Dr. Jean Stead, Reader

Date

Acknowledgements

Special thanks to Dr. Burkette, Mr. Faidley, Dr. Stead, the ETSU Accounting Department, and the College of Business and Technology. I will always be grateful for the knowledge I gained and the career I discovered.

Every gratitude to Dr. Wachs, Dr. Kornweibel, and the ETSU Honors College for giving me the opportunity to find my passion and pursue my ambition beyond my wildest dreams.

Thank you to my family for supporting me in everything I attempt and taking care of me when the stress becomes too much. You remind me to look up from my books and enjoy the people around me.

And finally, thank you to the ETSU University Honors Class of 2017. You have carried me through the most amazing four years of my life. I will never forget the late nights, the road trips, and the crazy adventures.

Abstract

Healthcare has recently begun a push towards more lean practices and management. Healthcare accounting, in an effort to reflect business practices, must change to accurately reflect reality. This research seeks to explore how healthcare providers improve their accounting systems to keep up with an ever-changing lean environment. By examining both healthcare and accounting literature, this comprehensive literature review seeks to answer the question, “How does healthcare accounting adapt to lean philosophies?”.

Background

Over the years, lean practices have become ubiquitous in the healthcare industry. Finding a hospital without some sort of lean improvements in progress would prove to be a rare occurrence. However, lean practices were originally developed for large scale manufacturing. In order to better understand its applications to healthcare, one must first understand how lean philosophies came to be. Toyota is typically seen as the originator of lean with its system of Just-In-Time (JIT) manufacturing. The idea behind Toyota's manufacturing philosophies is that outputs should be free of defects, customizable, and manufactured with minimal waste (Collins and Muthusamy, 2007). Since Toyota debuted JIT manufacturing, several other process improvement systems have cropped up, including six sigma, total quality management, continuous quality improvement, and lean.

Unlike JIT, Six Sigma tends to focus heavily on maximizing an organization's bottom line through specific projects. Six Sigma uses a heavy reliance on statistical analysis to eliminate sources of error and waste. With its focus on projects, Six Sigma tends to be implemented by teams with special training in this analysis. Green Belt and Black Belt certifications identify those who have studied the methodology of Six Sigma and how to best apply it (Gowen, et. Al., 2012). This process improvement system is particularly appealing to healthcare organizations because of its emphasis on reducing error, a source of much concern in a patient-driven industry. In healthcare, errors can lead to costly litigation and a devalued reputation.

Continuous Quality Improvement, though similar to Six Sigma, can be distinguished by its emphasis on an entire organization, rather than on specific error sources. This process improvement system places a heavy emphasis on quality and improvement through defined steps. CQI does share certain traits with Six Sigma, though. In particular, both systems share an

emphasis on team projects and tangible results. Everything in CQI is done with performance in mind (Gowen, et. Al., 2012).

Finally, lean is a process improvement philosophy centered on waste reduction, efficiency, and customer demands (Luo and Brozovsky, 2013). Lean shares many similarities with the other process improvement philosophies. Like JIT, lean focuses on minimizing costs through waste reduction. Lean also mirrors JIT in that there is an emphasis on customer demand and customizable products. When comparing lean to Six Sigma, one can see that both share a commitment to bottom line through tangible results. Continuous Quality Improvement is echoed in lean management practices through the pursuit of quality on an organizational scale. These process improvement systems are all unique, yet share enough similarities that they are often implemented together under the name “lean management” (Kennedy and Widener, 2008; Gowen, et. Al., 2012).

For the sake of simplicity, this research will focus on lean practices from a broad view. To that end, lean will be defined similarly to Kennedy and Widener’s research. The prevailing definition seems to be that lean processes are business practices that work together to eliminate waste and errors, meet customer demands as quickly as possible, and create a streamlined, efficient process for delivering value. Lean accounting, then, is the set of practices used by accounting departments to support the management initiatives discussed above (Kennedy and Widener, 2008). There are several common attributes that tend to be found when lean is involved. Value streams are the preferred method of cost allocation, allowing companies to assign costs to a project from beginning to end (Luo and Brozovsky, 2013). This allows companies to look at a particular value stream and identify inefficiencies. Lean also demands constant data in order to identify areas for improvement and waste minimization. In order to

better provide customers with products on demand with adherence to customer specifications, there is also an emphasis on minimal inventory (Luo and Brozovsky, 2013).

Although lean management seems to be widely accepted, its accounting practices still face challenges. According to GAAP, inventory is treated as an asset. However, how does an accounting department accurately reflect that a business's small inventory is a good thing when GAAP has no provisions to do so? According to Luo and Brozovsky (2013), there may be a challenge in properly matching revenues to expenses when waste minimization comes into play. Because lean goals are framed differently than those pursued by the companies around which traditional accounting methods and principles are based, there may also be difficulty in accurately reflecting other byproducts of lean management: production capacity, inventory turnover, and lead times.

As lean management continues to make its way through healthcare systems, administrators must ask themselves whether their accounting systems and financial statements continue to accurately reflect their organizations. Many will find the answer to be no. So, in order to present themselves to stakeholders accurately, healthcare organizations will need to modify and update their accounting practices while still adhering to accounting principles and regulations. The objective of this research is to examine the existing literature and determine how much research has been done into these accounting system changes and what, if any, best practices exist.

Methodology

Because this research is a literature review, it was important that the articles chosen be held to a strict standard. The method of finding the articles for this research can be broken down into three steps: choosing databases, creating a matrix, and narrowing the list down to something

manageable for an undergraduate thesis. Using resources from both the UNC Writing Center and Purdue OWL, a method for narrowing the articles was determined as well as clarity about what needed to be included. All of the literature was obtained from the ETSU Sherrod Library and as such, heavily utilized their databases and criteria.

From the beginning, the goal was to draw articles from both health and business databases. For the health databases, those more centered on public health and healthcare administration took precedence over those with a focus on clinical studies and scientific theory. After searching the Sherrod Library list of databases, five databases emerged that met all of the criteria. Of these, two are more heavily geared towards business and three are more centered on health management. Out of the five, ProQuest Health Management was the most helpful and comprehensive. In order of article search, the five databases are ProQuest Accounting and Tax, ABI/Inform, Pubmed, CINAHL Complete, and ProQuest Health Management.

After choosing the databases, a matrix was created to hold all of the articles' information in a central, easy to read location. Because Microsoft Excel is most readily available and easy to use, it was utilized to create the matrix. Using Excel made it easy to filter results and hide cells to only look at the categories that were relevant at any time during the research. As Table 1 shows, the matrix includes: title, year, journal, and database. This matrix was compiled after considering which attributes would be the most significant to the research. Although all attributes listed were necessary, "year" and "database" were especially crucial. These two are important to the analysis of the makeup of the articles that were actually used in the following literature review. See Appendix A for the full matrix.

TABLE 1

Title	Database Accessed	Year Published	Journal
5 ways to make cost accounting a strategic function in hospitals.	CINAHL Complete	2013	Healthcare Financial Management
A control framework: Insights from evidence on lean accounting	ProQuest Accounting and Tax	2008	Management Accounting Research
A Strategic Planning and Cost Management Model for Managed Care Companies	ProQuest Accounting and Tax	2007	Management Accounting Quarterly

After choosing databases and setting up the matrix, the article search could begin. In order to conduct the search, it was necessary to set standard criteria in order to filter results. For language, it was determined that any article used must be in English. The researcher's language skills outside of English are such that any translation could not be trusted. A choice was also made to focus solely on peer-reviewed articles. While this may have eliminated relevant articles from my search, the researcher is confident that this enhances the overall quality of the literature. With five databases, a limit of fifteen to twenty articles per database was imposed. Knowing that it would not be realistic to use every article, there needed to be some limits for the initial search.

Beyond these simple criteria, there were several requirements that were necessary for a thesis combining research from two ever-evolving fields.

Every year, accounting standards are added and updated. In order to keep the literature relevant, the date range on each database was set to 2002 thru 2016. 2002 was significant as a beginning point in order to avoid an excess of literature prior to the Sarbanes-Oxley Act. This act has had such a large impact on the accounting profession, but examining the changes brought about by its finer points is outside the scope of this research. Fifteen years of research is still enough to write a literature review, yet not so outdated that this thesis is irrelevant. Because accounting follows different standards in different countries, it was also an important distinction to ensure that any literature used was applicable to the United States. This was simply a matter of practicality; with all of the articles originating in the United States, arguments would not have to navigate the difference between Generally Accepted Accounting Principles in the US and International Financial Reporting Standards outside the US.

Once there was a standard set of criteria for each database, the researcher was able to begin my article search. Using key words, such as “lean accounting” and “healthcare”, relevant articles were systematically identified from each database. The limit of fifteen to twenty articles was soon found to be unnecessary as most of the databases seemed to yield ten to twelve. After exhausting all of the databases, a list of eighty articles emerged. Three of the articles were listed twice, so it was a simple matter to eliminate them immediately. Others were able to be eliminated when it was determined that their content was not US-specific. Although the filter was set to exclude results from outside the United States, articles dealing with accounting outside the US but written by American professors slipped into the results. Even after eliminating these, the researcher was left with a list of sixty articles.

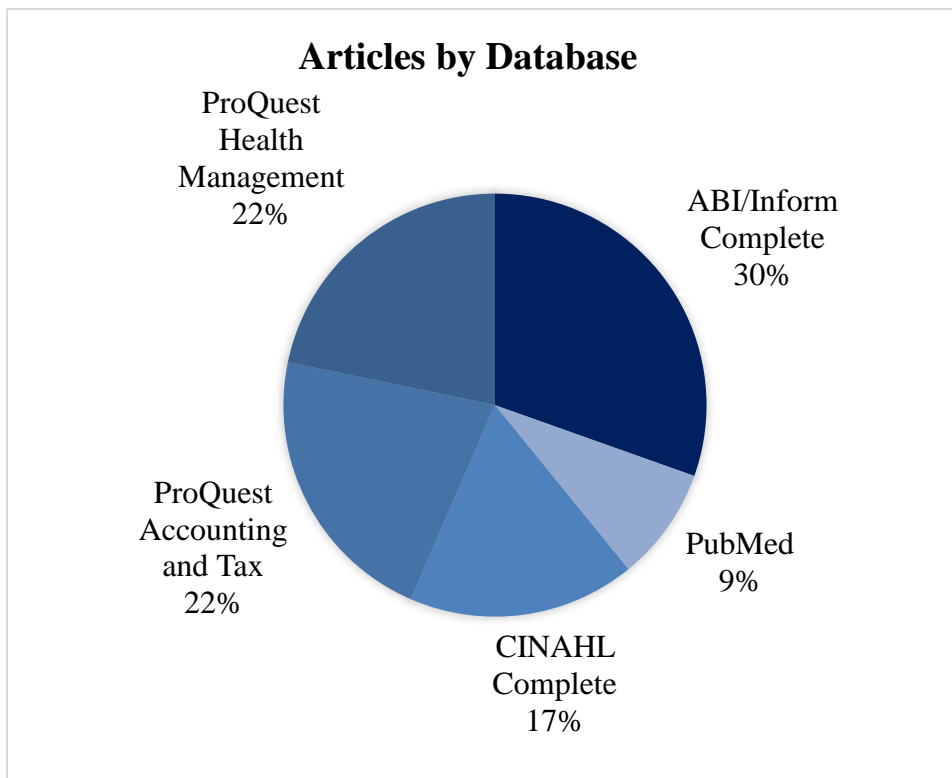
In order to narrow down these articles, it was important to revisit the research question. How does healthcare accounting integrate lean accounting practices to supplement lean management philosophies? Any articles selected to be included needed to be able to help answer this question. With this in mind, the abstracts provided the information needed to eliminate irrelevant articles. Some of the research seemed to be entirely too specific, focusing only on applications for how a certain department could reduce costs. Other studies seemed to be entirely too broad and conceptual. The researcher's goal was to balance the two in order to develop a better understanding of lean management, the lean accounting used to supplement those philosophies, and how this fits into healthcare. After going through the abstracts and eliminating articles that would not fit, there were twenty-three articles left. This seemed to be a good number from which to build the literature review.

Composition of Articles

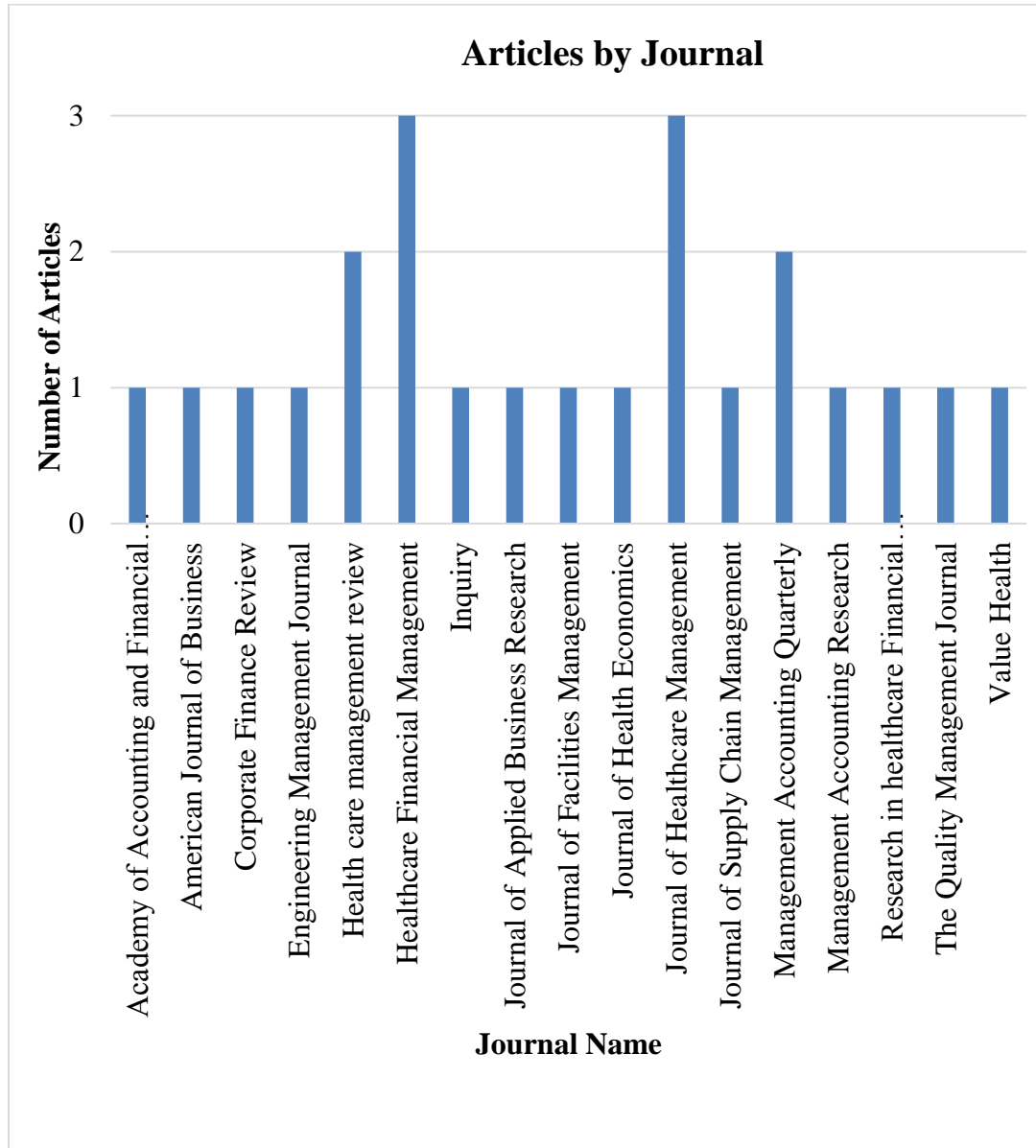
Upon examination, the twenty-three articles chosen for this literature review are drawn from a variety of sources. In the following tables, one can see the distribution of articles across various categories. Here, it seemed most important to examine the distribution across databases, journals, and year in order to determine whether or not the literature is skewed in any way.

Table 2 shows the distribution of articles by database. As the chart reveals, fifty-two percent of the articles come from the two business databases and forty-eight percent come from the three healthcare databases. Upon examination of Table 2, one can see that the most articles are found in ABI/Inform Complete with thirty percent. In comparison, only nine percent of the articles are found in Pubmed.

TABLE 2



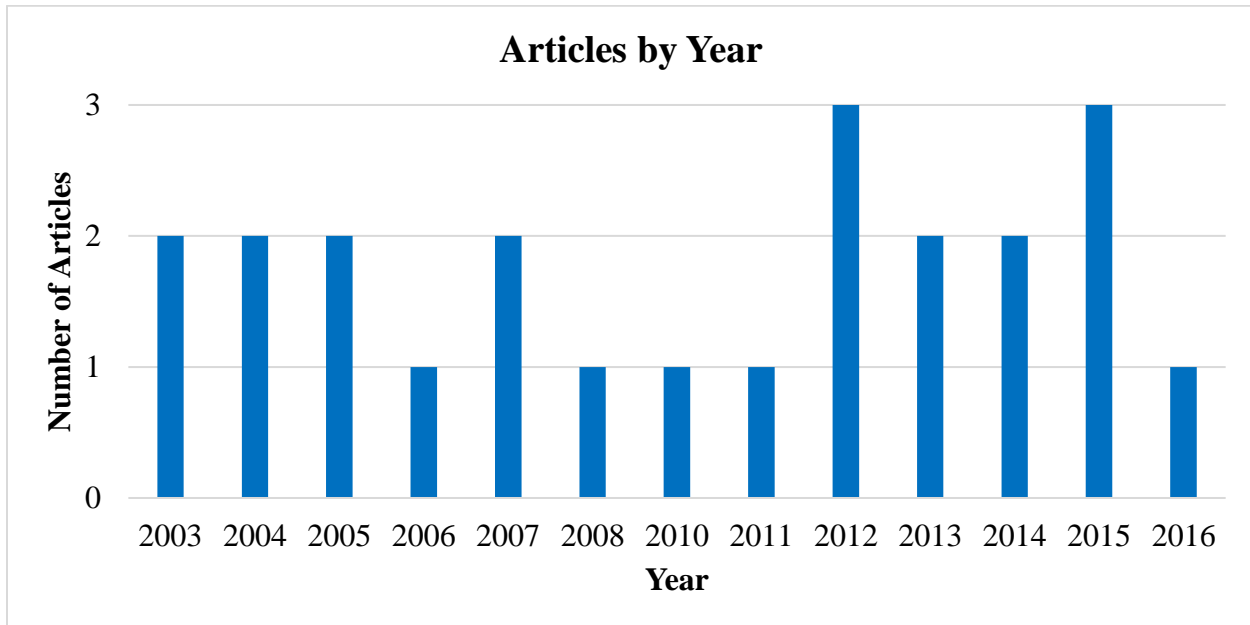
As one can see in Table 3 on the following page, each journal supplied between one and three articles. Only four of the journals provide more than one article. *Journal of Healthcare Management* and *Healthcare Financial Management* provide the most articles at three each. This is preferable as accounting and healthcare provide a background for this research, but the ultimate goal is to look at the union between the two. Utilizing articles from journals specifically focused on business allows this to be done more efficiently.

TABLE 3

Finally, it is important to examine the articles by year. As mentioned earlier, accounting is an ever-changing field. With standards constantly being updated, it is important that the research be relevant. Although the parameters for the article search were set to include 2002, any articles from that year were eliminated after examination of their abstracts showed them to be irrelevant to the research. Table 4 on the following page shows the breakdown by year. It is

significant to note that half of the articles are from the last six years, with 2012 and 2015 being the only years to supply three articles.

TABLE 4



From these tables, it can be seen that there is a fairly even distribution across the three categories. While each category has small variances, such as more articles coming from 2012 and 2015, they are acceptable. Each variance is not significant enough to skew the research. Now that the articles are compiled, the true research can begin. Each article must be read and put into the overall context of the research question and current conversation.

Findings

Before examining the literature any further, it is important to note that most of the findings relate to for-profit hospitals and healthcare systems. Leone and Van Horn (2005) demonstrate that non-profit hospitals have more incentive to spend and to manage their earnings.

This leads one to believe that lean principles would not be as applicable to non-profit hospitals. Therefore, they are not included in the scope of the rest of the articles.

Ricky Arredondo (2014) describes cost accounting as “the crossroad of the processes and metrics used to evaluate how effectively the organization is managing patient care, understanding utilization, and optimizing revenue”. Because hospitals are judged on the value they deliver to patients and the cost of their services, their cost accounting strategies face intense scrutiny. Although it may be beneficial to switch strategies, it may require additional resources to adapt technology and train accountants in the new system. When switching, it is important to consider the return on investment of a new strategy and why a new system will be used (Arredondo, 2014). One of the major issues that any new system must address is the difficulty of accounting for indirect costs and unique patient needs in a value stream. Spence points out in “5 Ways to Make Cost Accounting a Strategic Function in Hospitals” (2013) that many organizations are structuring costs along service lines, or value streams, thereby creating a sense of responsibility for the value streams.

In recent years, there has been a push to pay for value provided rather than a laundry list of services. However, it remains difficult to measure value in healthcare. Lee, et. Al. (2016) proposes using cost data to measure value through activity-based costing, claiming that this method of costing provides more accurate data than others without using additional resources needed for time-driven activity-based costing. Activity-based costing allows users to identify more accurate costs of value streams by assigning costs of each action that contributes to a patient’s care (Pandey, 2012). ABC has become increasingly important in healthcare as a way to guard against traditional costs being used without knowledge of what actually went into a value stream. This costing method allows practitioners to identify waste-generating activities. By

focusing on improving processes associated with waste-generating activities, healthcare providers can not only improve bottom line results, but also become purveyors of best practice standards (Griffith, et. Al., 2020). Kelemen, et. Al., (2007) specifically advise reducing costs associated with selling, general, and administrative processes in order to aid lean principles. They also advocate activity-based costing as a more accurate way to assign these costs to value streams.

In their 2015 article, Dyas, et. Al., propose a simplified form of activity-based costing for use in Six Sigma healthcare environments. Although there have been concerns about the application of lean to healthcare regarding how to standardize services without sacrificing quality of care, the emphasis on reduction of error and waste is typically enough of a reason to implement the management philosophies. In proposing their own cost model, they rely heavily on time-driven activity-based costing. In the cost-benefit analysis performed on their model, cost complexity was reduced, leading to fewer billable hours required for calculations.

Because many cost reductions occur in non-care departments, such as facilities, Kaszubski and Ebben (2004) proposed using activity-based costing to identify cost drivers for change management efforts. They pursued a case study of Beaumont Services Company to demonstrate the utility of this model. In order to do so, they organized BSC into 84 cost centers to isolate departments and functions. Kaszubkis and Ebben's model places emphasis on user behavior as a cost driver, which is well in line with lean's philosophy of removing actions that do not add value to a process.

As far as value streams go, Kaplan, et. Al. (2014), feel that time-driven activity-based costing is the best way to account for the costs of treating a single patient over the term of their care. Time-driven activity-based costing differs from traditional activity-based costing in that it

brings in elements of process mapping, a part of industrial engineering. Process mapping allows one to see an entire value stream from beginning to end. Accountants then assign cost per minute rates to each activity. Lean practitioners can then seek to reduce costs by reducing the time spent on each activity. This is similar to Kaszubski and Ebben's (2004) idea that behavior drives costs.

Personnel and material costs are the greatest costs in the value stream (Kaplan, et. Al., 2014). In manufacturing, a response to ABC has cropped up in the form of resource consumption accounting, which is based on the capacity of resources (Perkins and Stovall, 2011). In resource consumption accounting, labor is seen as proportional, which means that as input grows, outputs grow at a proportional rate. This is applicable to lean practitioners in healthcare who want to minimize costs through labor. This approach would advise them to maximize labor to full capacity in order to maximize value derived from that labor. Resource consumption accounting also demands that the cost of excess capacity, for example empty hospital beds, should not be applied to existing product, or current patients (Perkins and Stovall, 2011).

The final costing approach to appear in the literature is target costing. While useful in heavy research and development fields, such as pharmaceuticals, it is not as applicable to healthcare practitioners in the field. The best example of target costing in healthcare is costing highly individualized procedures like surgeries. When planning the surgery, one can estimate the standard price and desired profit (Ellram, 2006) in order to arrive at a target cost. However, should complications arise during the procedure, additional labor and materials may be required. As such, while target costing is applicable for negotiating prices with insurance companies, it is not as applicable as a response to lean philosophies in a healthcare environment.

In addition to costing methods, the literature also shows concern about the cost of turnover in the healthcare professions. In order to minimize costs, Broyles, et. Al. (2004),

suggest that employing support personnel and utilizing them in patient care is cost efficient. This may be a solution to the problem illustrated by Waldman, et. Al. in their 2010 article entitled, “The Shocking Cost of Turnover in Health Care”. They identify the cost of turnover as a non-value-adding element of the overall costs of the organization. While some see this turnover as “a cost of doing business”, Waldman, et. Al., posit that this high turnover is unnecessary. Their findings conclude that offering compensation to stay is more cost efficient than hiring new staff. By utilizing support personnel as Broyles, et. Al. recommend, the cost of turnover can be alleviated by promoting the support staff rather than looking for an outside hire.

Another issue that lean seeks to address is inventory. Wilson, et. Al. (2015) conducted a case study of an ambulatory care clinic and presented some interesting results. Because so much of the operating budget is dedicated to materials management, they suggested a new inventory management system in order to reduce stockouts which contributed both in labor costs and additional costs of obtaining materials quickly. By implementing a new system, the clinic was able to reduce the time spent on obtaining materials, thereby lowering the costs that accountants must work into the value stream and apply to patients.

Conclusion

Upon reading the literature, two things became apparent. First, more research is needed to determine best practices. Second, much of the research that has been done is disjointed and tends to be directed towards cost savings. A major challenge to this research, however, is making the determination regarding the cause of these changes. It is often difficult to ascertain whether the changes are made in response to the implementation of lean philosophies. That being said, healthcare accounting does seem to be evolving in the hopes of more accurately reflecting business practices. Specifically, healthcare providers seem to be focusing on which cost methods

to use to best represent how much capital goes into a patient's care from admission to discharge. By separating activities into value streams, accountants can assign costs to these activities which in turn are assigned to the patient. To that end, much of the literature suggests that activity-based costing and time-driven activity based costing are the more popular methods of responding to lean philosophies of cost reduction and waste elimination. These methods allow accountants to calculate standard cost rates, incentivizing practitioners to efficiently deal with patient issues.

Recommendations for Future Research

In light of the findings from this literature review, there are several routes for further research. First, the researcher would recommend a survey of comparable hospitals in order to investigate what kind of lean systems they have implemented, whether or not they have changed their accounting systems in light of that, and how their accounting systems have changed. This would allow future researchers to compare the different approaches that hospital accounting departments use to keep up with lean systems. These researchers would also be able to look for correlations between different lean systems and accounting changes, as well as compare the success of the different combinations. This literature review indicates that many of the survey participants would show an increased utilization of activity-based costing.

Another option would be to observe a hospital implementing a new lean system and follow the process through its completion. The research could place a special emphasis on the timing of any accounting changes that follow the lean implementation. If several of these case studies were conducted, a comparison could then be made regarding the effectiveness of different implementation timings. This would, of course, require a prolonged time commitment and quite a bit of cooperation from the observed hospitals, making it difficult for a student to conduct the research independently.

As lean systems continue to grow in healthcare organizations, accounting systems will continue to adapt. By further researching when and how to make necessary changes, best practices can be outlined, allowing healthcare providers to save the time and money that would be lost to trial and error. Lean is not going to disappear anytime soon and healthcare seems willing to fully embrace its benefits. This will provide researchers with ample opportunity to dig deeper into the implications of lean moving into a service industry and the consequence for accounting systems and methods.

Bibliography

- Arredondo, Ricky. (2014). Why Revisit Your Cost-Accounting Strategy. *Healthcare Financial Management*, 68.7, 68-73. Retrieved from <http://web.b.ebscohost.com.iris.etsu.edu:2048/ehost/detail/detail?sid=ff83f726-da2d-4973-82e6-567e356c3670%40sessionmgr4002&vid=1&hid=4109&bdata=JnNpdGU9ZWhvc3QtbG12ZQ%3d%3d#AN=103978979&db=ccm>.
- Ballou, Brian, et. Al. (2003). Nonfinancial Performance Measures in the Healthcare Industry. *Management Accounting Quarterly*, 5.1, 11-16. Retrieved from <http://search.proquest.com.iris.etsu.edu:2048/accountingtaxbanking/docview/222854636/A2846B82CD154BD5PQ/12?accountid=10771>.
- Broyles, Robert, et. Al. (2004). The Differential Costs of Employing Support Personnel: An Approach to Improving Efficiency and Fiscal Performance. *Research in Healthcare Financial Management*, 9.1, 69-84. Retrieved from <http://search.proquest.com.iris.etsu.edu:2048/healthmanagement/docview/200501250/88FE451C71064BA1PQ/30?accountid=10771>.
- Collins, Kevin, & Muthusamy, Senthil. (2007). Applying the Toyota Production System to a Healthcare Organization: A Case Study on a Rural Community Healthcare Provider. *The Quality Management Journal*, 14.4, 41-52. Retrieved from <http://search.proquest.com.iris.etsu.edu:2048/abicomplete/docview/213610852/D432A432F5A04DB0PQ/3?accountid=10771>.

Dyas, Sheila, et. Al. (2015). Process Improvement Cost Model for the Emergency Department.

Journal of Healthcare Management, 60.6, 442-458. Retrieved from

<http://search.proquest.com.iris.etsu.edu:2048/abicomplete/docview/1747594768/6E6A37C4AB994E68PQ/36?accountid=10771>.

Ellram, Lisa. (2006). The Implementation of Target Costing in the United States: Theory Versus Practice. *Journal of Supply Chain Management*, 42.1, 13-26. Retrieved from

<http://search.proquest.com.iris.etsu.edu:2048/abicomplete/docview/235220506/6E6A37C4AB994E68PQ/46?accountid=10771>.

Finkler, Steven, & Ward, David. (2003). The case for the use of evidence-based management research for the control of hospital costs. *Health Care Management Review*, 28.4, 348-365. Retrieved from

<http://search.proquest.com.iris.etsu.edu:2048/healthmanagement/docview/194734197/88FE451C71064BA1PQ/46?accountid=10771>.

Gowen, Charles R. , et. Al. (2012). Contrasting Continuous Quality Improvement, Six Sigma, and Lean Management for Enhanced Outcomes in US Hospitals. *American Journal of Business*, 27.1, 133-153.

Griffith, John, et. Al. (2005). The Revolution in Hospital Management. *Journal of Healthcare Management*, 50.3, 170-190. Retrieved from

<http://search.proquest.com.iris.etsu.edu:2048/healthmanagement/docview/206730462/88FE451C71064BA1PQ/20?accountid=10771>.

Hilsenrath, Peter, et. Al. (2015). Price-Transparency and Cost Accounting: Challenges for Health Care Organizations in the Consumer-Driven Era. *The Journal of Healthcare*

Organization, Provision, and Financing, 52, 1-5. Retrieved from

<http://web.b.ebscohost.com.iris.etsu.edu:2048/ehost/detail/detail?sid=db98e135-b260-48b5-898f-e4b5f972faa8%40sessionmgr4002&vid=1&hid=4109&bdata=JnNpdGU9ZWhtvc3QtbGl2ZQ%3d%3d#AN=109810277&db=ccm>.

Kaplan, Robert, et. Al. (2014). Using Time-Driven Activity-Based Costing to Identify Value Improvement Opportunities in Healthcare. *Journal of Healthcare Management*, 59.6, 399-413. Retrieved from

<http://search.proquest.com.iris.etsu.edu:2048/abicomplete/docview/1634452215/D432A432F5A04DB0PQ/2?accountid=10771>.

Kaszubski, Michael, & Ebben, Steve. (2004). Using activity-based costing to implement behavioural cost initiatives successfully. *Journal of Facilities Management*, 3.2, 184-192. Retrieved from

<http://search.proquest.com.iris.etsu.edu:2048/healthmanagement/docview/218925765/ED664C69601F472BPQ/5?accountid=10771>.

Kelemen, Dennis, et. Al. (2007). A Strategic Planning and Cost Management Model for Managed Care Companies. *Management Accounting Quarterly*, 8.4, 37-47.

Retrieved from

<http://search.proquest.com.iris.etsu.edu:2048/accountingtaxbanking/docview/222849940/A2846B82CD154BD5PQ/3?accountid=10771>.

Kennedy, Frances, & Widener, Sally. (2008). A Control Framework: Insights from Evidence on Lean Accounting. *Management Accounting Research*, 19, 301-323. Retrieved from

<http://search.proquest.com.iris.etsu.edu:2048/accountingtaxbanking/docview/220614229/294DE51CF348B4PQ/8?accountid=10771>.

Lee, Ken, et. Al. (2016). Developing a Measure of Value in Healthcare. *Value in Health*, 19, 323-325. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/27325323>.

Leone, Andrew, & Van Horn, R Lawrence. (2005). How Do Nonprofit Hospitals Manage Earnings? *Journal of Health Economics*, 24.4, 815-837. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/15896858>.

Luo, Jie, & Brozovsky, John. (2013). Lean Accounting and Information Adjustment in Efficient Industries: Assimilation Ahead? *Academy of Accounting and Financial Studies Journal*, 17.4. Retrieved from <http://search.proquest.com.iris.etsu.edu:2048/accountingtaxbanking/docview/1464620880/542AC88DA4D24B4DPQ/5?accountid=10771>.

Olubunmi, Faleye. (2012). Controlling Healthcare Costs: Barking Up The Wrong Tree? *Corporate Finance Review*, 16.6, 27-34. Retrieved from <http://search.proquest.com.iris.etsu.edu:2048/accountingtaxbanking/docview/1431036052/A2846B82CD154BD5PQ/8?accountid=10771>.

Pandey, Seema. (2012). Applying the ABCs in Provider Organizations. *Healthcare Financial Management*, 66.11, 112-120. Retrieved from <http://web.b.ebscohost.com.iris.etsu.edu:2048/ehost/detail/detail?sid=b13acc69-7eab->

4582-93fa-

a3ac079df045%40sessionmgr107&vid=1&hid=4109&bdata=JnNpdGU9ZWhvc3QtbGl2

ZQ%3d%3d#AN=108077768&db=ccm.

Perkins, David, & Stovall, O. Scott. (2011). Resource Consumption Accounting – Where Does It Fit? *Journal of Applied Business Research*, 27.5, 41-51. Retrieved from

<http://search.proquest.com.iris.etsu.edu:2048/abicomplete/docview/889140205/6E6A37C>

[4AB994E68PQ/24?accountid=10771](http://search.proquest.com.iris.etsu.edu:2048/abicomplete/docview/889140205/6E6A37C4AB994E68PQ/24?accountid=10771).

Spence, Jay. (2013). 5 Ways to Make Cost Accounting a Strategic Function in Hospitals.

Healthcare Financial Management, 67.3, 40. Retrieved from

<http://web.b.ebscohost.com.iris.etsu.edu:2048/ehost/detail/detail?sid=7fa776a1-0d26->

[481c-bbd0-](http://web.b.ebscohost.com.iris.etsu.edu:2048/ehost/detail/detail?sid=7fa776a1-0d26-481c-bbd0-)

[a597e6dc32fa%40sessionmgr4004&vid=1&hid=4109&bdata=JnNpdGU9ZWhvc3QtbGl](http://web.b.ebscohost.com.iris.etsu.edu:2048/ehost/detail/detail?sid=7fa776a1-0d26-481c-bbd0-a597e6dc32fa%40sessionmgr4004&vid=1&hid=4109&bdata=JnNpdGU9ZWhvc3QtbGl2)

[2ZQ%3d%3d#AN=107996217&db=ccm.](http://web.b.ebscohost.com.iris.etsu.edu:2048/ehost/detail/detail?sid=7fa776a1-0d26-481c-bbd0-a597e6dc32fa%40sessionmgr4004&vid=1&hid=4109&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#AN=107996217&db=ccm)

Waldman, J. Deane, et. Al. (2010). The Shocking Cost of Turnover in Health Care. *Health Care Management Review*, 35.3, 206-211. Retrieved from

<http://search.proquest.com.iris.etsu.edu:2048/healthmanagement/docview/194731403/88>

[FE451C71064BA1PQ/42?accountid=10771](http://search.proquest.com.iris.etsu.edu:2048/healthmanagement/docview/194731403/88FE451C71064BA1PQ/42?accountid=10771).

Wilson, Kaycee, et. Al. (2015). Reducing Stockouts in a Cancer Center's Ambulatory Care Clinics. *Engineering Management Journal*, 27.3, 99-108. Retrieved from

<http://search.proquest.com.iris.etsu.edu:2048/abicomplete/docview/1761611054/C47660>

[A216F64A8BPQ/18?accountid=10771](http://search.proquest.com.iris.etsu.edu:2048/abicomplete/docview/1761611054/C47660A216F64A8BPQ/18?accountid=10771).

Appendix A – Reference Matrix

Title	Database Accessed	Year Published	Journal
5 ways to make cost accounting a strategic function in hospitals.	CINAHL Complete	2013	Healthcare Financial Management
A control framework: Insights from evidence on lean accounting	ProQuest Accounting and Tax	2008	Management Accounting Research
A More Detailed Understanding Of Factors Associated With Hospital Profitability.	PubMed	2016	Health Affairs
A simulation model of hospital management based on cost accounting analysis according to disease.	CINAHL Complete	2004	Journal of Medical Systems
A Strategic Planning and Cost Management Model for Managed Care Companies	ProQuest Accounting and Tax	2007	Management Accounting Quarterly

Title	Database Accessed	Year Published	Journal
Accounting for teaching hospitals' higher costs and what to do about them	ProQuest Health Management	2003	HealthAffairs
Allocating physicians' overhead costs to services: an econometric/accounting-activity based-approach.	CINAHL Complete	2002	Journal of Health care finance
An introduction to cost analysis.	CINAHL Complete	2015	Journal of the American Academy of Physician Assistants
Applying cost accounting to operating room staffing in otolaryngology: time-driven activity-based costing and outpatient adenotonsillectomy.	CINAHL Complete	2015	Otolaryngology - Head & Neck Surgery
Applying the ABCs in provider organizations.	CINAHL Complete	2012	Healthcare Financial Management

Title	Database Accessed	Year Published	Journal
Applying the Toyota Production System to a Healthcare Organization: A Case Study on a Rural Community Healthcare Provider	ABI/Inform Complete	2007	The Quality Management Journal
Balanced scorecard, activity-based costing and company performance: An empirical analysis	ProQuest Health Management	2003	Journal Of Managerial Issues
Centralizing audit processes for lean efficiency: real-world experiences.	PubMed	2015	Healthcare Finance Magazine
Challenges and Opportunities Facing Public Hospitals	ProQuest Accounting and Tax	2014	The Journal of Government Financial Management
Contrasting continuous quality improvement, Six Sigma, and lean management for enhanced outcomes in US hospitals	ABI/Inform Complete	2012	American Journal of Business

Title	Database Accessed	Year Published	Journal
CONTROLLING HEALTHCARE COSTS: BARKING UP THE WRONG TREE?	ProQuest Accounting and Tax	2012	Corporate Finance Review
Cost Accounting for the Radiologist	CINAHL Complete	2014	American Journal of Roentgenology
Cost Management Using ABC for IT Activities and Services	ProQuest Accounting and Tax	2004	Management Accounting Quarterly
Cost Management: A Strategic Focus	ABI/Inform Complete	2006	Issues in Accounting Education
Cost Management: Measuring, Monitoring, and Motivating Performance	ABI/Inform Complete	2005	Issues in Accounting Education

Title	Database Accessed	Year Published	Journal
Cost Management: Strategies for Business Decisions	ABI/Inform Complete	2005	Issues in Accounting Education
Counting the costs: the risks of regulating and accounting for health care provision.	CINAHL Complete	2008	Health, Risk & Society
Developing a Measure of Value in Health Care.	PubMed	2016	Value Health
Do Lean Implementation Initiatives Have Adequate Accounting Support?: The Debate of Duality	ProQuest Accounting and Tax	2013	Management Accounting Quarterly
Estimating the mission-related costs of teaching hospitals	ProQuest Health Management	2003	Health Affairs

Title	Database Accessed	Year Published	Journal
Evaluating Service Departments As Value Streams	ABI/Inform Complete	2014	Journal of Business and Economics Research (Online)
Evaluating Service Departments As Value Streams	ABI/Inform Complete	2014	Journal of Business and Economics Research (Online)
Exploring the role of standard Costing in lean manufacturing enterprises: a structuration theory approach	ProQuest Accounting and Tax	2011	Management Accounting Quarterly
Exploring the Use of Lean Thinking and Six Sigma in Public Housing Authorities	ABI/Inform Complete	2010	The Quality Management Journal
Healthcare not-for-profits: FASB exposure draft highlights flexibility in financial statement presentation.	CINAHL Complete	2016	Healthcare Financial Management

Title	Database Accessed	Year Published	Journal
Healthcare not-for-profits: FASB exposure draft highlights flexibility in financial statement presentation.	PubMed	2016	Healthcare Finance Management
HIV Patients in the HCUP Database: A Study of Hospital Utilization and Costs	ProQuest Health Management	2004	Inquiry
HOSPITAL FINANCIAL DISTRESS, RECOVERY AND CLOSURE: MANAGERIAL INCENTIVES AND POLITICAL COSTS	ProQuest Accounting and Tax	2011	Journal of Public Budgeting, Accounting & Financial Management
How Do Nonprofit Hospitals Manage Earnings?	PubMed	2005	Journal of Health Economics
How low can you go? The impact of reduced benefits and increased cost sharing	ProQuest Health Management	2003	HealthAffairs

Title	Database Accessed	Year Published	Journal
Implementing a trustworthy cost-accounting model.	CINAHL Complete	2015	Healthcare Financial Management
Improving health care costing with resource consumption accounting.	CINAHL Complete	2016	International Journal of Healthcare Quality Assurance
Improving health care costing with resource consumption accounting.	PubMed	2016	International Journal of Healthcare Quality Assurance
LEAN ACCOUNTING AND INFORMATION ADJUSTMENT IN EFFICIENT INDUSTRIES: ASSIMILATION AHEAD?	ProQuest Accounting and Tax	2013	Academy of Accounting and Financial Studies Journal
Lean Production Systems: Resistance, Success and Plateauing	ABI/Inform Complete	2012	Review of Business

Title	Database Accessed	Year Published	Journal
Linking Manufacturing Strategy to Product Cost: Toward Time-Based Accounting	ProQuest Accounting and Tax	2007	Management Accounting Quarterly
Long-term Trends in Healthcare: Implications for the Leasing Industry	ProQuest Accounting and Tax	2006	The Journal of Equipment Lease Financing
Management accounting in the twenty-first-century firm: a strategic view	ProQuest Health Management	2003	Strategic Change
Measuring Technical Efficiency of specialty hospitals in the US	ProQuest Accounting and Tax	2008	Journal of Revenue and Pricing Management
New FASB Standard Addresses Revenue Recognition Considerations	CINAHL Complete	2015	Healthcare Financial Management

Title	Database Accessed	Year Published	Journal
Nonfinancial Performance Measures in the Healthcare Industry	ProQuest Accounting and Tax	2003	Management Accounting Quarterly
Operational and contextual drivers of hospital costs	ABI/Inform Complete	2011	Journal of Health Organization and Management
Patient Accounting Systems: Are They Fit with the Users' Requirements?	PubMed	2016	Health Information resources
Pay for Performance: Are Hospitals Becoming More Efficient in Improving Their Patient Experience?/PRACTITIONER APPLICATION	ABI/Inform Complete	2015	Journal of Healthcare Management
PRICE MANAGEMENT IN NONPROFIT HOSPITALS	ProQuest Accounting and Tax	2014	Journal of Public Budgeting, Accounting & Financial Management

Title	Database Accessed	Year Published	Journal
Price-Transparency and Cost Accounting: Challenges for Health Care Organizations in the Consumer-Driven Era.	CINAHL Complete	2015	Inquiry
Prioritizing lean management practices in public and private hospitals.	PubMed	2016	Journal of Health Organization and Management
Process-Improvement Cost Model for the Emergency Department/PRACTITIONER	ABI/Inform Complete	2015	Journal of Healthcare Management
Public Perceptions Of Cost Containment Strategies: Mixed Signals For Managed Care	ProQuest Health Management	2004	HealthAffairs
Quality Management and Lean: A Symbiotic Relationship	ABI/Inform Complete	2014	The Quality Management Journal

Title	Database Accessed	Year Published	Journal
Reducing Stockouts in a Cancer Center's Ambulatory Care Clinics	ABI/Inform Complete	2015	Engineering Management Journal
Resource Consumption Accounting - Where Does It Fit?	ABI/Inform Complete	2011	Journal of Applied Business Research
Resource Consumption Accounting Applied: The Clopay Case	ProQuest Accounting and Tax	2004	Management Accounting Quarterly
Stability and change: an institutionalist study of management accounting change	ProQuest Health Management	2005	Accounting, Auditing & Accountability Journal
Strategies for change: adaptation to new accounting conditions	ProQuest Accounting and Tax	2012	Journal of Accounting and Organizational Change

Title	Database Accessed	Year Published	Journal
The Airplane Game: Lean Accounting Takes Flight	ProQuest Accounting and Tax	2012	Management Accounting Quarterly
The case for the use of evidence-based management research for the control of hospital costs	ProQuest Health Management	2003	Health care management review
THE DIFFERENTIAL COSTS OF EMPLOYING SUPPORT PERSONNEL: AN APPROACH TO IMPROVING EFFICIENCY AND FISCAL PERFORMANCE	ProQuest Health Management	2004	Research in healthcare Financial management
The Implementation of Target Costing in the United States: Theory Versus Practice	ABI/Inform Complete	2006	Journal of Supply Chain Management
The Revolution in Hospital Management/PRACTITIONER APPLICATION	ProQuest Health Management	2005	Journal of Healthcare Management

Title	Database Accessed	Year Published	Journal
The Shocking Cost of Turnover in Health Care	ProQuest Health Management	2010	Health care management review
The utilization of activity-based cost accounting in hospitals.	CINAHL Complete	2005	Journal of Hospital Marketing and Public Relations
Throughput Metrics Meet Six Sigma	ProQuest Accounting and Tax	2011	Management Accounting Quarterly
Time-driven Activity-based Costing More Accurately Reflects Costs in Arthroplasty Surgery.	CINAHL Complete	2016	Clinical Orthopaedics and related research
Time-driven activity-based costing trumps traditional cost accounting for radiologists	CINAHL Complete	2015	American Journal of Roentgenology

Title	Database Accessed	Year Published	Journal
Understanding Pharmaceutical Research Manipulation in the Context of Accounting Manipulation	CINAHL Complete	2013	Journal of Law, Medicine, and Ethics
Using activity-based costing to implement behavioural cost initiatives successfully	ProQuest Health Management	2004	Journal of Facilities Management
Using Time-Driven Activity-Based Costing to Identify Value Improvement Opportunities in Healthcare	ABI/Inform Complete	2014	Journal of Healthcare Management
Value in Pediatric Orthopaedic Surgery Health Care: the Role of Time-driven Activity-based Cost Accounting (TDABC) and Standardized Clinical Assessment and Management Plans (SCAMPs).	CINAHL Complete	2015	Journal of Pediatric Orthopaedics
What Is Driving Hospitals' Patient-Safety Efforts?	ProQuest Health Management	2004	HealthAffairs

Title	Database Accessed	Year Published	Journal
Why Revisit your cost accounting strategy	CINAHL Complete	2014	Healthcare Financial Management