

INPATIENT OUTSOURCED DIALYSIS: SCORECARDS USEFULNESS AND USABILITY
FOR MONITORING PATIENT SAFETY

By

Stephanie Wendl, B.S.N., R.N.

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Faculty Chair: Pamela Willson, Ph.D., A.P.R.N., F.N.P.-B.C., C.N.E., N.E.-B.C., F.A.A.N.P.

Committee Member: Diana Dolan, Ph.D., R.N.

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Abstract

Background: Dialysis services are expected to meet quality metrics as conditions of coverage for The Joint Commission. The use of scorecards improved the ability to monitor quality in areas for infection prevention and safety. A two-phase quality improvement project was undertaken to evaluate the perceived usefulness and usability of Dialysis Service Scorecard (DSS) among 12 regional hospital partners.

Methods: In phase I the DSS was designed, developed, and piloted. Five key Joint Commission metrics were assessed. Scorecard data collection, staff training, report building, and six-month outcomes were presented to the leadership team at the pilot facility. In Phase II regional leader teams were surveyed to determine the DSS's perceived usefulness and usability for monitoring safety quality indicators using a 20-item electronic survey.

Results: Responder roles ranged from Nurse Executives to Infection Preventionists at both urban (n=8) and rural (n=2) hospitals. The majority of hospitals (n=7) were urban facilities with less than 500 hundred beds. Most (90%) leaders reported previous use and 60% found the Dialysis Service Scorecard "extremely useful".

Conclusion: Dialysis Service Scorecards readily identify areas that are lacking in quality performance standards providing hospital leaders with a valuable quality performance management tool.

Keywords: scorecards, balanced scorecards, hemodialysis, quality metrics, quality improvement, report card, nursing, quality, quality care, stakeholders

Introduction

Problem Description

In recent years dialysis has been identified as one of the top areas of concern for infection prevention and safety however, little research is available that discusses the potential value a scorecard has for dialysis services to report their quality metrics (Bland, 2018). To review the literature an initial search on balanced scorecards was done where 25,147 results were found. Adding to the search terms the word hemodialysis, the number dropped to 3. Of these three results, none specifically discussed the use of scorecards for outsourced inpatient dialysis service programs. An additional search using the terms balanced scorecards and health care resulted in 1,785 articles. These 1,785 articles were filtered with inclusion criteria of English language, full text, peer reviewed articles and a timeline of 2013-2019 which yielded 179 results.

Available Knowledge

Through multiple searches of the literature with various search terms such as scorecards for quality improvement, use of scorecards in healthcare, and quality improvement in healthcare and scorecards (all with the inclusion criteria of full text, peer reviewed, English, and 2010-2019) it was found that the majority of literature available supports the use of scorecards in healthcare for continuous quality improvement (Behrens & Oldenkamp, 2000; Chawla, Modi, Rewari, Verma, & Chhabra, 2017; Lupi, Verzola, Carandina, Salini, Antonioli & Gregorio, 2011; Nippak, Veracion, Muia, Ikeda-Douglas, & Isaac, 2016).

Rationale

In the current healthcare market, there is an understanding that a priority for healthcare providers is to provide quality care as a way of measuring the performance of a facility (Behrouzi, Shaharoun, & Ma'aram, 2014). What has resulted from this shared understanding in

the healthcare industry is large amounts of quantitative data on multiple performance improvement areas. So, the question becomes what to do with all of the data and how can it be synthesized to tell the story of the current state of quality care being provided at various levels of the industry. Behrens and Oldenkamp (2000) discuss the issues that occur in healthcare organizations where large amounts of data are collected in the name of quality improvements and that many times facilities focus on data collection that “is either focused on the wrong performance improvement areas, requires too much data collection, and/or is not statistically significant” (Introduction, para. 2). Behrens and Oldenkamp (2000) recommend that facilities adopt a tool that would allow leadership and staff to easily understand and incorporate useful quality data into practice. Because healthcare facilities do not always have resources to provide all specialty services by their own hospital personnel, some of the services must be outsourced and providers contracted in to provide services. One service commonly outsourced is dialysis care.

Outsourced inpatient dialysis services have many tools available for data collection. Data available from the electronic charting reports offer results of hepatitis charting, number of patients with central lines, number of central line infections, documentation of central line care, delays and many more data points that can assist in viewing the quality of care patients are receiving. However, these reports result in massive amounts of individual data and analysis of group data overtime is left to laborious hand calculations. Cattinelli et al. (2012) discuss the value of the existing scorecards for incenter hemodialysis units, however these scorecards are not available tools for inpatient services (Cattinelli, Bolzoni, Barbieri, Mari, Martin-Guerrero, Soria-Olivas, ... Amato, 2012). Bouland, Fink, and Fontanesi (2011) discuss the need for a system to

organize available data. According to Baker (2015) “turning massive amounts of data into usable information is key to improving patient care” (p.223).

Specific Aims

While the overall findings of this literature review point to the need for healthcare leaders to have an easy to understand tool to track and trend quality indicators, it also supports the need for a method to involve stakeholders in the creation and implementation of a change in reporting metrics. Gunawardena (2011) discusses the importance of involving stakeholders’ and that a “one size fits all” approach will most likely be unsuccessful (p. 342). Therefore prior to implementing such a tool an important step will be to understand how useful such a tool will be to the stakeholders that will be receiving them. According to Davis (1989) it is vital to understand the perceived usefulness and usability of a system before making a decision to implement it (p.323). Nippak, Veracion, Muia, Ikeda-Douglas, and Isaac (2016) identified a need to implement a balanced scorecard into their HIM department. Prior to its implementation a use questionnaire was distributed to 45 members of the HIM team (Nippak et al., 2016). Of the 45 team members 42 completed the survey (Nippak et al., 2016). The overall findings of this survey were reported as 76% of respondents approved the HIM scorecard as a management useful tool (Nippak et al., 2016). According to Nippak et. al. (2016) it was vital for the HIM team to understand the implementation of a scorecard for ensured success. Therefore, knowing that dialysis providers in hospital facilities collect large amounts of quality data, a data management tool is needed to synthesize this information, and that stakeholder involvement is vital, I propose a quality improvement project to evaluate among hospital partners, what is the perceived usefulness and usability of a “Dialysis scorecard” as part of a quarterly quality report.

Method

The incorporation of a dialysis service scorecard (DSS) into practice is based on the Lean technique theory. The Lean technique focuses on prioritizing efficiency (Shaw & Carter, 2015). Considering today's healthcare market and the search for ways to reduce waste, increase efficiency, and decrease costs, the Lean technique seems most appropriate. The use of a DSS will offer more precise, less confusing data to the hospitals which will result in shorter meetings and less phone calls or emails questioning data points on the current reports submitted monthly. Furthermore, using the Lean technique will assist in reducing wasteful old data collection habits. Literature is limited but support is available for implementing lean techniques into healthcare. Benfield et al. (2015) incorporated Lean into a renal replacement process and concluded that the lean process improved efficiency in the workflow and increased staff satisfaction (Benfield, Brummond, Lucarotti, Villarreal, Goodwin, Wonnacott, Talley, & Heung, 2015).

Context

The need for this project was identified when the hospital requested data that offered a trending of patients that experienced delays. No such item existed and in researching ways to create such an item, results consistently pointed to the value of a DSS. For this project to be successful two phases were necessary. Phase I was the creation and piloting of the tool that will be used as the scorecard. Phase II was the evaluation of the usefulness and usability of a DSS.

Intervention Phase I

During phase I a single facility was chosen to pilot a DSS for reporting. An excel workbook was created and used as the scorecard, quality metrics included were identified based on contractual obligations (See Figure 1. for image of DSS). The method for data collection was the current reports that the electronic medical record can generate, reports from Biomed, and

manual audits. Reports from the electronic medical record include data on adverse events, hepatitis B documentation, central line care documentation, total delays, incomplete/cancelled procedures, and census numbers. Steps for running these reports are as follows: log into the electronic medical record, navigate to user options, select the report needed, select the organization desired, select the hospital desired, select the time frame desired from the calendar option, then run the report. For the hepatitis report and adverse event report, select the option labeled hepatitis report or adverse event report and follow the same steps as described above. For central line documentation and census, select the quality indicators report and follow the above detailed steps. Central line documentation may be further analyzed through an internal automated treatment charting report located in an internal system. The data for census has an additional method of viewing that displays the number of cancelled and incomplete treatments. To generate this report an internal billing report was generated. The last report available gave details pertaining to the delays in care. This report, along with all other reports, were customized to exclude patient identifying information. To obtain the number of patients that dialyze on the same day that they discharge, a manual tracking method was used. The charge nurse was required to log into the hospital medical record and manually look up each discharged patient and cross compare the date they discharged with the list of patients dialyzed each day. The charge nurse documented dialyzed on day of discharge "yes" or "no" on their data sheet. This data sheet was faxed to the program manager daily. The last two metrics, water quality and equipment maintenance were provided by Biomed. Water quality was measured via monthly water culture collection, reports were submitted to the program manager monthly. Machine maintenance was documented on each machine log book and reported in BioMed's quality workbook.

The creation of this tool did not incur any cost. The need to complete more accurate charting and more frequent audits were identified as a cost. Staff now being included in audit completion resulted in increased salary cost per treatment due to the extended amount of time staff was on the clock while completing audits. Additional costs resulted due to training sessions on accurate charting and also on how to effectively complete the audits. The additional costs resulting from this project affected the dialysis company. Since the hospital and dialysis company are in a contractual relationship, being able to provide the hospital with clear data allowing for accurate action planning should result in improved quality patient care as well as a better relationship and outweigh the costs that were incurred as a result.

Intervention Phase II

A usefulness and usability electronic survey was created and shared with the stakeholders at twelve different facilities. The questions for this survey were created using existing questions from Davis' (1989) work on perceived usefulness and usability of information technology and adapted to fit the subject topic of a DSS. A report was created to introduce the idea of the value of adding a scorecard to the facilities quality data reports. In the report a preview of the proposed DSS was included to compare the data points with the current quality reports. Within the report an invitation was included for the leaders to follow a link to a twenty-question electronic survey where they were asked to give their perception on the ease of use and usability of a DSS. There were no costs incurred related to the creation of the information report or the electronic survey. All surveys responses were kept confidential and no identifying information was requested on the survey.

Ethical Considerations

Phase I. Because the DSS was introduced to just one facility that the dialysis program had a service contract agreement and because the DSS did not include any patient identifying data there were no ethical concerns in its trial use. Patients were not asked to participate in any part of the data collection nor were staff members of the facility asked to participate. The data points collected for the initial presentation of the scorecard was data that the facility received on a quarterly basis in the form of a multi-page report. The DSS was a way to present the same data in a more precise easy to read format.

Phase II. Assessing the perceived usefulness and usability of a DSS did not have any ethical concerns. The survey was only shared with the leadership of facilities where a contractual agreement existed between the facility and the dialysis company and where the dialysis company was the sole provider of services.

Results

Phase I

After data was collected on the pilot DSS for six months, as described above, it was presented to the chosen single facility to review during a quarterly meeting. This hospital was not provided the survey, nor the description report prior to seeing the DSS for the first time. The initial response to the DSS was positive however the facility requested changes to the DSS. It was requested that the previous full calendar years data be collected and reported on the DSS for benchmarking purposes, that the data points change based on the results and that if a metric is reported as being 100% compliant for greater than three months, the action will be that the metric is changed to something new, lastly, it was also requested that the target goals be changed to 100% compliant. It was determined phase II will introduce the method of a balanced scorecard

and will assess stakeholder's perceived ease of use and usability of a scorecard specifically for outsourced dialysis services.

Phase II

In Phase II the electronic survey was shared with twenty leaders between twelve different facilities. The survey remained open for a total of two weeks. At the closing of the survey, a total of ten (N=10) responses were received for a response rate of 50%. Of the participants 80% (N=8) were from urban facilities and 20% (N=2) were from rural facilities. Participants were primarily executives, nurse managers and a director for a total response rate from this group of 70% (N=7). A single quality coordinator and 2 infection control nurses make up the remainder of the participants. Of the twenty questions, seven questions were to collect data on the participants type of facility, position within said facility, years in position and experience with scorecards as a management tool. The remaining thirteen questions were geared specifically at the participants rating their perceived usability and usefulness of scorecards. See Table 1 for specific survey questions presented to the respondents. A Likert scale was used for the perceived usability and usefulness of a DSS with a range of 1-5 with 1 representing extremely unlikely and 5 being extremely likely. Each number on the Likert scale was assigned a points value where a score of 1 represented 1 point to a 5 representing 5 points. The maximum score was 65 (13 multiplied by 5) and the lowest possible score being a 13 (13 multiplied by 1). It was decided that a higher score represents a positive perception of the ease of use and usability of the DSS. Results of survey responses can be viewed in Table 2 by item, value scores, and cumulative total score. The average score for the DSS was 44.8 representing an overall (68.9%) positive view of the DSS as a useful and useable tool.

Discussion

Summary

The use of scorecards for quality improvement is supported in the literature, however little information is available concerning dialysis providers utilizing this effective management method. In phase I of this quality improvement project a DSS was created and piloted in an isolated hospital. The initial feedback received was as expected where the facility found value with the incorporation of a DSS and requested its continued use. The unexpected response was the facility requesting goals to change and an expectation of perfection with 100% as the target range as well as requesting the metrics monitored to change once the targets were met consistently. This response led to an assumption that there was a misunderstanding regarding what the DSS was. This misunderstanding of what the DSS would contribute to the facilities quality improvement efforts led to phase II, where a report and survey was created introducing the DSS as a quality tool meant to supplement the already provided quality report. Because the quality report is a multi-page report with large amounts of data, the DSS would be a supplemental resource provided to the hospital.

Interpretation

The DSS provides a quick summary that at a glance one can quickly get a clear picture of the quality care being provided. The results of the survey on the usefulness and usability of the DSS supported the use of scorecards as a valuable and effective supplemental quality improvement management tool. With an overall positive average score of 44.8 out of 65 it can be concluded that hospital facilities would find value if more usable and useful data were provided to them from their outsourced dialysis provider. While quality data is provided on a quarterly basis, this information comes in the form of a multi-page report. Facility leadership personnel are busy individuals so to provide a supplement to the report, where the same information is

provided only in a concise single page workbook, is a crucial resource. The literature review did not reveal any previous work discussing the study of understanding the perceived usefulness and usability of a DSS by an outsourced inpatient dialysis service provider. Because of this no comparison can be made between the results of this papers survey and other comparable surveys on the same topic. The literature review also did not reveal other studies on the ability of a scorecard to improve quality care of patients receiving dialysis at a hospital where an outsourced dialysis provider was contracted for these services.

Limitations

This project is not without its limitation. Because there were no other articles discovered addressing the use of a DSS for inpatient dialysis services nor any addressing a hospital facilities perceived ease of use and usability of a DSS, comparisons of the results could not be made. A limitation of Phase I was the introduction of a DSS to a single facility at one isolated meeting. Phase II limitation was the small sample size of only 20 leaders. While the survey was shared with all regional facilities in which a contract for services exists, their responses may be skewed by the limited numbers.

Conclusion

In conclusion, hospital leadership view scorecards as a positive addition to their management toolkits. Giving hospitals an easy-to-interpret tool that allows for month over month trending will create an atmosphere allowing easier identification of improvement areas, thus resulting in an overall advancement in quality patient care while improving the efficiency of the inpatient dialysis program. Suggested next steps are to expand the sample size surveyed to assess a larger variety of leaders at facilities of varying sizes. Because the literature supports the use of

scorecards as a quality improvement management tool future research is needed on the use of a DSS and its effect on improving the quality care provided by outsourced dialysis providers.

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Table 1

Perceived Usefulness and Perceived Ease of Use for Scorecards Questions

-
1. What score would you give to scorecards as a management tool?
 2. How likely would using the Dialysis Scorecard in your job enable you to accomplish tasks more quickly?
 3. How likely would using the Dialysis Scorecard improve your job performance?
 4. How likely would using the Dialysis Scorecard Report increase your productivity?
 5. How likely would using the Dialysis Scorecard Report enhance your effectiveness on the job?
 6. How likely would using the Dialysis Scorecard Report make it easier to do your job?
 7. How useful would you find the Dialysis Scorecard in your job?
 8. How likely would learning to operate (Excel report) the Dialysis Scorecard Report be easy for you?
 9. How likely would you find it easy to get the Dialysis Scorecard Report to do what you want it to do?
 10. How likely would you find data on the Dialysis Scorecard Report easy to locate?
 11. How likely would you find data from the Dialysis Scorecard Report clear and understandable?
 12. How likely would you find the Dialysis Scorecard Report to be flexible to interact with?
 13. How likely would you find the Dialysis Scorecard Report easy to use?

Note: Adapted from "Perceived Usefulness, Perceived Ease of Use, And User Acceptance of Information Technology", by Davis, 1989, *MIS Quarterly*, p. 340.

Table 2

Dialysis Scorecard (DS) Survey Results by Item, Scored Values, and Cumulative Total (N=10)

On a scale of 1-5, with 5 being the highest ranking:	1	2	3	4	5	Total
DS rank as a management tool	1			4	5	42
DS enables me to accomplish tasks more quickly				4	6	46
DS improves my job performance			1	5	4	43
DS Report increases my productivity	1		1	5	3	39
DS Report enhances your job effectiveness	1		1	3	5	41
DS Report makes it easier to do my job				4	6	46
DS is useful in your job				4	6	46
DS (Excel report) operation is easy for me				2	8	48
DS Report easily does what I want it to do				4	6	46
DS Report data is easy to locate			1	1	8	47
DS Report clear and understandable			1	1	8	47
DS Report is flexible to interact with			1	3	6	45
DS Report is easy to use			1	1	8	47

Note: Adapted from "Perceived Usefulness, Perceived Ease of Use, And User Acceptance of Information Technology", by Davis, 1989, *MIS Quarterly*, p. 340.

Figure 1. Dialysis Service Scorecard by Clinical Outcomes, Customer Loyalty, Financial Outcomes, Staff Focus, and Unit Growth

Dialysis Scorecard										Definition	Data Received From
Annual FY											
January 2018											
Metric	Priority	Monthly			Year to Date			Yr End Target	Yr End Projection		
		Score	Actual	Target	Variance	Score YTD	Current Actual YTD				
Impact Performance											
Clinical Outcomes											
Adverse Events	M			0			0	5		preventable pt event that resulted in transfer to higher level of care	Acute
Hepatitis B Documentation	M			0%			0%	100%		100% if lab results obtained on every pt	Hospital/Dialysis clinics/ACEP
Handoff Report given to RN	M			0%			0%	100%		RN or RN report before and after dialysis	ACES
Water Quality Tracking	M			0%			0%	100%		water culture being performed monthly with required follow up documented	Dialysis Biomed report
CVC Site Documentation	M			0%			0%	100%		RN documented assessment and dressing change on access line	ACES
Equipment Maintenance	M			0%			0%	100%		Performance maintenance completed & documented timely	Dialysis Biomed report
Customer Loyalty											
Patient Complaints	M			0			0	11		Protect physician or staff reported complaints	Hospital or physician
Patient Delays	M			0%			0%	10%		% of patients with a documented delay	ACES
Financial Outcomes											
Dis w/ Dialysis same day Discharge	M			0			0	150		Patients receiving dialysis on the same day as discharge	Charge nurse report
Incomplete procedure after set up	M			0			0	12		Documented incomplete pt procedure	ACES/Billing
Staff Focus											
Employee Retention	M			0%			0%	90%		# employees left turnover/Total # employees	Personnel data
Goals											
Pt Volumes Overall	M										
... 2A	M										
... 2B	M										
... CRRT	M										
... TPE	M										
... CCPD/CAPD	M										
Sample Footer Text											
										3/10/19	6

Figure 1. Adapted from and used with permission of Jennifer Ellis, M.S.N., R.N. Nursing Director at Presbyterian Hospital