

Hospital Denial Management: Improving Speed of Revenue Collection

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Abstract– *This research aims to increase the speed of revenue collection in a hospital to increase revenue. Denial management (when third party payers refuse to cover expenses for the service for any reason) is an excellent tool to improve the speed and amount of revenue collection. There are two types of general services provided by the hospital: ambulatory and admission. In case there is a third party denial, documentation is reviewed, corrected, and resent. When a second denial occurs the hospital representative may appeal at the medical plan’s office. Through an effective documentation and communications system, along with suggestions to implement denial management correctly, the percent of revenue could be increased by 3% to 5%.*

Keywords– *revenue cycle and collection, denial management.*

I. INTRODUCTION

A local private hospital in Puerto Rico is having problems with their revenue cycle management which has a direct impact on the speed of their revenue collection which in turns is affecting this health service enterprise to realize their earnings. The situation presented by the hospital gave an excellent opportunity to the researchers to solve the problem applying industrial engineering techniques, such as cost analysis and control and cost optimization to generate feasible recommendations. The main objective is to make recommendations to help the hospital increase the speed of revenue collection to accurately invest when needed; which in turn would increase revenue (and earnings) in the long run.

The methodology used for this research included four steps: problem identification, review of literature, data gathering and analysis, and recommendations. *Problem identification* included visiting the hospital to discuss and understand their issues related to denial management. *Review of literature* included finding relevant literature to help the researchers learned and understand the details of a hospital revenue cycle. *Data gathering and analysis* included obtaining real data to identify opportunities to improve denial management and revenue collection. *Recommendations* were generated after analyzing the available data for various months and using the academic literature to validate the recommended steps to the hospital management.

II. REVIEW OF RELEVANT LITERATURE

The review of relevant literature was divided into the following: understanding the revenue cycle of a hospital, learning about denial management, and identifying the deterrents to revenue collection.

The hospital revenue cycle is the series of steps that occur or are taken in order to generate revenue. It begins with the

registration of the patient for a designated service: ambulatory or admission services. The revenue depends greatly on how well the process of documentation works for patient registration, charge capture, and billing [1]. It is estimated that most organizations can recoup 3% to 5% of annual revenues through effective denial management [2].

A denial is when a bill sent for an offered service is rejected by a third party payer [2]. The criteria used by the auditors to accept or “deny” a certain bill are given by the InterQual Guidelines [3]. Denial management is a mechanism used to prevent errors in codification and communication with third party payers [4]. With this method it is possible to increase the speed of revenue collection and to make better investments. Important details about denials are: denials are looked as an opportunity rather than a problem; denial statistics and metrics can become the backbone of the entire revenue cycle program; many denials are reworked and never end up as write-offs, etcetera [2].

Some of the most common denial reasons found within hospitals are: criteria for clearing a patient to leave; medical insurance plans determine that a patient should have been cleared before the actual date, etcetera. Some of the most common deterrents found in the literature are: fear associated with the admission that there is a denial problem; sheer complexity of third-party denials, etcetera. It is crucial for the hospital management to identify effective ways to work with the deterrents to ensure revenue is collected as expected [2].

III. DATA GATHERING

Data was collected to understand the revenue cycle of the hospital. It begins with the registration of the patient for a service: ambulatory or admission. There are four types of documentation: inpatient includes regular admission and skilled nursing facility; outpatient includes previously scheduled services and the Emergency Room (ER). It is decided in the ER if a patient will be admitted or treated as an ambulatory case.

When the patient is admitted to the hospital, a record of received treatments is needed. A patient must spent more than 24 hours in the hospital to be considered an admission. After a patient is cleared to leave, the inpatient record is completed and audited, the services are codified, and sent to the billing department where they will send the information to third party payers. Before that deductibles are charged. A specified amount of funds from medical plans is assigned to cover ambulatory services. Inpatient coverage is variable. For third party denials due to missing information or misplaced charges

the documentation has to be corrected and resent. If a second denial occurs the hospital will appeal to the medical insurance office through its Denial Management Department (DMD). After the processes of servicing and documentation, the DMD revise and correct the bills before presenting them to the external auditors. They use an outdated software system to handle the denials. A new one has been designed to accomplish the task of permitting better denial management.

IV. ANALYSIS OF DATA

The hospital management provided real data to analyze their situation dealing with denials regarding the amount of bills processed and the amount and percentages of approved and denied bills. Data is presented in Table 1 and Figure 1.

Table 1. Approved hospital bills vs. Denials for four months

Month	Total	Approved Bills	Denied Bills	% of approvals
First	427	261	166	61.12%
Second	573	347	226	60.56%
Third	245	165	80	67.35%
Fourth	354	207	147	58.47%
Accumulated	1,599	980	619	61.28%

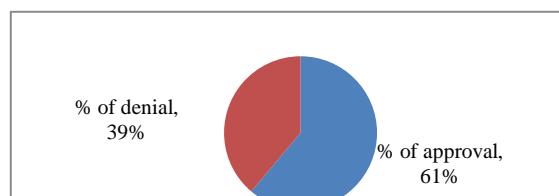


Figure 1. Cumulative percentage of approvals and denials

Their denial management can be improved because almost 40% of the processed bills were not correct. It means that the hospital was not able to receive on time payments for the services offered, affecting their ability to timely generate earnings. The reasons for the denials were identified and classified into: patient release criteria – an inpatient is released without sufficient information to confirm if the action was appropriate; operational delays - denied bills that show delays in providing medical services or performing required actions; inefficient documentation - it is deemed insufficient or incomplete; intensity vs. severity unmatched - treatment provided to the patient does not match the severity of the ailment; criteria for admittance - criteria is not justified. Results of a Pareto analysis of the data is presented in Table 2.

Table 2. Pareto analysis of denial reasons

Denial Reason	Count	Contribution
Patient Release Criteria	226	41.77%
Intensity vs. Severity unequal	116	21.44%
Criteria for Admittance	86	15.90%
Inefficient Documentation	84	15.53%
Operational Delays	29	5.36%
Cumulative	619	100%

Table 2 shows that almost 80% of the denials are due to the top three reasons. If efforts are dedicated to improve these categories of denials, the speed of revenue collection and the

revenue should increase. The other denial reasons do not have to be considered right away for the continuous improvement analysis. To justify the investment on the new software, Return on Investment (ROI) and Payback Period (PB) analyses are presented for different scenarios using an estimated cost of the software of \$2,270,038 and an estimated hospital's revenue (based on the average of last three years) of \$18,726,516. Equations (1) and (2) are used to calculate ROI and PB.

$$ROI(\%) = \frac{\text{Total estimated benefits (\$)} - \text{Investment (\$)}}{\text{Investment (\$)}} \quad (1)$$

$$PB(\text{years}) = \frac{\text{Investment (\$)}}{\text{Estimated benefits per year (\$/year)}} \quad (2)$$

Results for three different scenarios based on 3% to 5% of increased revenues were calculated (refer to Table 3). ROI calculations were done assuming three years of benefits. Results shown on Table 3 demonstrate that acquiring the new software will be beneficial for the hospital if they are able to increase revenue by more than 4% for at least three years.

Table 3. ROI and PB estimates

Scenario	Expected Benefits per Year (\$)	ROI (%)	PB (years)
3% revenue increase	\$561,795	-75.25%	4.04
4% revenue increase	\$749,060	-1.01%	3.03
5% revenue increase	\$936,326	23.74%	2.42

V. PRELIMINARY RECOMMENDATIONS AND FUTURE STEPS

A review of literature of hospitals' revenue cycle is presented. It was applied to a Puerto Rico hospital using real data. Based on data analyzed some recommendations were generated. The new software the hospital is evaluating should bring benefits if revenues continue to increase every year. It could be used to alert hospital personnel to attend issues involving the denial reasons identified on the Pareto analysis. Management may assess situations to make decisions before services are billed to reduce denials. Documentation must include sections for doctors to provide detailed information about their criteria for release, admittance, and decisions for treatment. Main focus is to provide reliable information to DMD. Future steps include more analysis of the denial reasons to pinpoint the main ones affecting revenue collection. Additional recommendations may be generated accordingly.

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