Case Study: PYA Analytics Tools Key to Solving Healthcare Revenue Cycle Issues

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Today's healthcare facilities face a number of challenges that impact optimal financial performance while managing razor-thin operating margins. PYA brings nationally recognized subject-matter experts and world-class data intelligence tools to our clients faced with such challenges. The following case study demonstrates how the PYA Managed Care and Analytics team assisted a key client (Client) with identifying underlying net revenue issues and provided a robust solution to remediate the unforeseen problems.

Background and Business Issue

The conversion to an electronic medical record (EMR) and billing system of a midsize community health system created a challenge for the Client. While processes were in place to plan for the transition from the legacy system to the new system, unintended consequences resulted. After a few months on the new electronic health record/billing system, the hospital's gross charges and net reimbursement amounts were significantly lower than under the legacy system. After an initial investigation, the majority of these reductions could not be explained by changes in service volumes and/or payer mix.

What went wrong?

Gross charges and net reimbursement ***decreased nearly 20%*** from historical levels after the EMR/billing system conversion.

PYA was asked to help determine what happened with the conversion process from the legacy chargemaster and billing system to the new system that would create a material negative impact to gross charges and net reimbursement.

PYA's Initial Assessment

Data – PYA received detailed patient transaction level encounter data for a defined time period during the year before the conversion and the same time period during the year after the conversion. This time period was established for the study to minimize seasonal variation in the mix or volume of services.

Different sources – As the raw data was provided from two different applications, the PYA team mapped the data to a common set of standards so a like-for-like analysis was readily available. Quality assurance (QA) was performed to ensure all data was mapped and included in the analysis.

Modeling and analysis – The patient transactional level encounter charge and payment dataset was modeled using **PYA's Revenue Management Tool**[1] to compare charges and volumes by department and by type of service (e.g., inpatient by Diagnosis Related Group (DRG), outpatient by type of encounter such as surgical procedure, emergency room visit, etc.) between the legacy system and the new billing system. From a net reimbursement perspective, PYA had to consider any impact on net revenue due to the change in gross charges based on the migration to the new system.

1 PYA's Revenue Management Tool is a proprietary tool designed by our managed care subject-matter experts and our business intelligence team to use large data sets to answer complex business questions.

Most commercial payer contracts have requirements to limit annual chargemaster pricing adjustments, so unintended price increases can cause a potential conflict with such provisions. In addition, this Client had a major payer contract that reimbursed hospital services based on a percent of billed charges. Any unintended decrease in gross charges billed to these payers due to the system conversion would result in a net revenue reduction.

Initial Learnings

Analysis by hospital department – Charges for hospital departments that converted from a per-minute charging method (such as anesthesia and recovery room services) to a per 15- or 30-minute unit charge were materially understated compared to the expected. Upon investigation, PYA determined the start and stop times for counting units were altered with the new system, resulting in services being classified into lower charge categories than initially modeled. After inquiry, PYA learned the method for measuring start and stop times in the new system could not be changed to mirror the legacy system. Our work, therefore, included resetting the charge amounts per unit to better align with historical charge levels on average per claim to neutralize the gross revenue impact.

Analysis by type of service – Charges by type of service (such as by DRG or surgical procedure) were also lower than historical levels based on our modeling tool results. Key learnings for this issue related to many factors; however, one key discovery was the charging for supplies in the new system vs. the legacy system. Upon investigation, PYA found material changes in the supply chain setup that resulted in legacy charges for supply-type items not getting a separate charge in the new system. Procedure-based charges needed to be increased to account for the level of supply-type charges set up in the new system (which could not be changed, given it was a systemwide setup).

Key Findings and Recommendations

OUTPATIENT SURGERY FINDINGS

PYA observed the surgical charges in the new system were significantly lower than in the legacy system on a per claim basis.

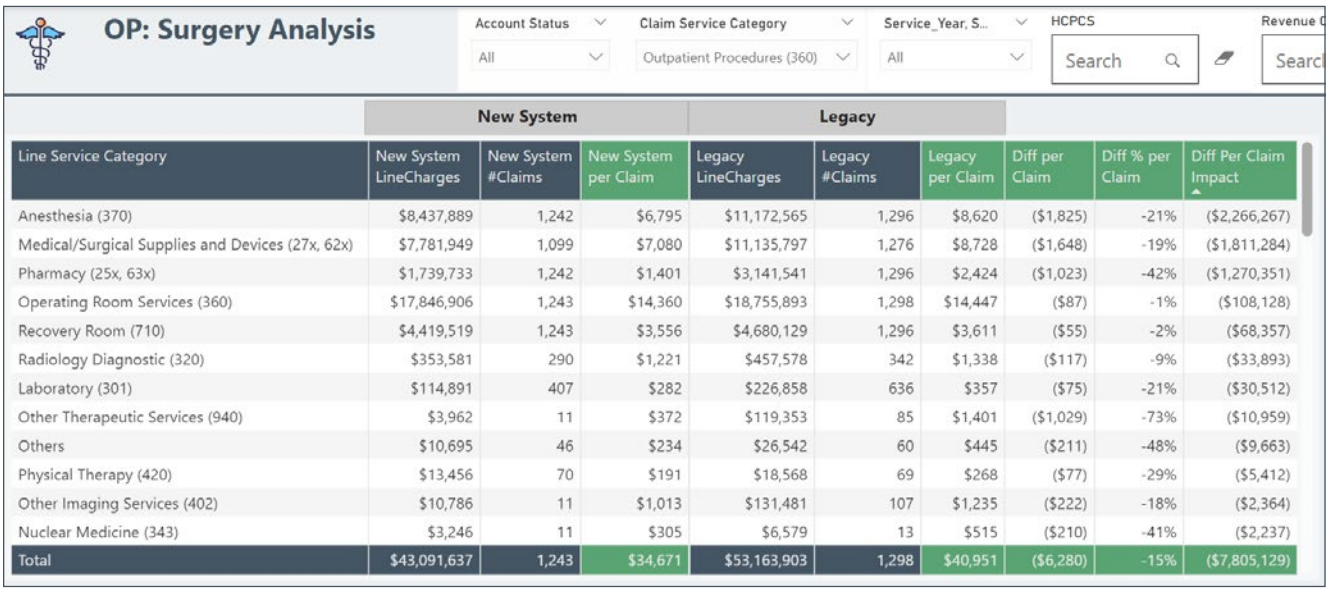
Figure 1 – Outpatient procedures example

	New System			Legacy System		
Sample	Current Volumes	Current Charges ($ million)	Average Charges per Case ($1,000)	Service Volumes	Historical Charges ($ million)	Average Charges per Case ($1,000)
Outpatient Procedures	1,243	$43.0	$34.6	1,298	$53.1	$40.9

Reduction in Average Charges per Case $6,280
(approx. 15% lower in new system vs. legacy system)

PYA's propriety Revenue Management Tool (snapshot in ***Figure 2 related to the outpatient surgery analysis)*** was used to extract detailed patient billing information by claim to identify the root causes and resolve the issue through chargemaster adjustments.

Figure 2 – PYA Revenue Management Tool (excerpt)



	New System			Legacy					
Line Service Category	New System LineCharges	New System #Claims	New System per Claim	Legacy LineCharges	Legacy #Claims	Legacy per Claim	Diff per Claim	Diff % per Claim	Diff Per Claim Impact
Anesthesia (370)	$8,437,889	1,242	$6,795	$11,172,565	1,296	$8,620	($1,825)	-21%	($2,266,267)
Medical/Surgical Supplies and Devices (27x, 62x)	$7,781,949	1,099	$7,080	$11,135,797	1,276	$8,728	($1,648)	-19%	($1,811,284)
Pharmacy (25x, 63x)	$1,739,733	1,242	$1,401	$3,141,541	1,296	$2,424	($1,023)	-42%	($1,270,351)
Operating Room Services (360)	$17,846,906	1,243	$14,360	$18,755,893	1,298	$14,447	($87)	-1%	($108,128)
Recovery Room (710)	$4,419,519	1,243	$3,556	$4,680,129	1,296	$3,611	($55)	-2%	($68,357)
Radiology Diagnostic (320)	$353,581	290	$1,221	$457,578	342	$1,338	($117)	-9%	($33,893)
Laboratory (301)	$114,891	407	$282	$226,858	636	$357	($75)	-21%	($30,512)
Other Therapeutic Services (940)	$3,962	11	$372	$119,353	85	$1,401	($1,029)	-73%	($10,959)
Others	$10,695	46	$234	$26,542	60	$445	($211)	-48%	($9,663)
Physical Therapy (420)	$13,456	70	$191	$18,568	69	$268	($77)	-29%	($5,412)
Other Imaging Services (402)	$10,786	11	$1,013	$131,481	107	$1,235	($222)	-18%	($2,364)
Nuclear Medicine (343)	$3,246	11	$305	$6,579	13	$515	($210)	-41%	($2,237)
Total	$43,091,637	1,243	$34,671	$53,163,903	1,298	$40,951	($6,280)	-15%	($7,805,129)

Note: To maintain client confidentiality, the charges and claims have been modified only without affecting the per claim results.

The reduction in average charges per case was caused by:

a) Per minute to per unit charging conversion for anesthesia and recovery room services

b) Supply charges in legacy system not transferred to new system systematically (i.e., lower supply charges per procedure in new system)

c) Some departmental charges reflected in different departments, requiring further mapping and analysis using PYA's Revenue Management Tool

ANESTHESIA DEEP DIVE

PYA also observed anesthesia charges were at a lower level than expected when adjusting for a small reduction in like-for-like volumes.

In collaboration with the Client, PYA selected sample claims from high-volume outpatient procedures, such as laparoscopic cholecystectomy and rotator cuff repairs. By looking closely at the medical records, we observed the anesthesia time (as defined by key operating room time-stamp markers) did not align with the charge on the account. Further research identified the new system had been programmed to look at different time-stamp markers than the legacy system. These new markers resulted in shorter "measured" anesthesia times in the new EMR and charge system, creating a material reduction in billed anesthesia facility charges per case.

Since the system time-stamp markers used in calculating the anesthesia minutes could not be altered, PYA worked with the Client to recalibrate the charges to achieve the appropriate level of gross charges on a per claim basis consistent with the legacy system and supporting documentation.

OTHER FINDINGS

PYA worked with the Client to confirm whether the other reductions and increases in the observed categories were appropriate (i.e., were they explainable by real events, or were they unintended). This process involved researching all information from the service type to the individual claim.

For example, certain aspects of the lower charges were explained by logical reasons, such as the significant reduction in COVID-19 DRG-related inpatient episodes, causing a decrease in intensive care unit (ICU) charges and a similar reduction in COVID-19 testing for all patients.

A sample set of patient accounts (legacy vs. matching set in the new system) were identified to demonstrate situations in which the data indicated a potential issue, e.g., PYA identified specific, high-volume, legacy procedures normally included in a certain lab panel, and the new system did not show that charge, or the legacy charges for another high-volume procedure normally included an ultrasound, but the new system did not show any ultrasound charges, but they were seen as ordered in the clinical record.

Recommendations and Implementation Plan

By reviewing the clinical record with the Client and talking with the hospital department leaders, many of the issues observed were satisfactorily explained and resolved. Other issues were indicated for charge adjustment to a neutral level (see ***Figure 3***).

Figure 3 – Next Steps

Analysis Results	Next Step Indicated	Comment
Reduction in charge volume explained through analysis (e.g., COVID tests).	No action needed.	Lower expectations in future state analysis.
Analysis shows that charge capture team is missing valid charges from the medical record.	Educate team or modify workflows/work queues.	Track when implemented to ensure capture.
Analysis indicates that the charge is no longer allowed (e.g., supply item) in the new system through "chargeable" definition change.	Increase charges where the charge is now deemed to be included (e.g., offset OR charges to maintain neutral charge levels in aggregate).	Track when implemented to ensure capture and neutrality.

Based on the data analytics tools and related analysis completed after the conversion, updates to the chargemaster were required to address the key issues to remediate any future losses in gross and net revenue. The chargemaster updates were reviewed with Client leadership before being implemented. Communication was required with key payers to demonstrate billed charges decreased temporarily due to the conversion process and were now being realigned to place billed charges in compliance with chargemaster increase contract provisions. See ***Figure 4*** for a summary of initial findings in gross revenue and net revenue.

Figure 4 – Example revenue impact

Issue Description	Solution (for Neutral Charge Impact)	Gross Charge Estimated Impact ($ Million)	Net Charge Estimated Impact ($ Million)
Anesthesia	Increase anesthesia charge rates as calculated to compensate for shorter anesthesia measured time	$2.1	$0.8
Pass-through supplies	Increase procedure rates to compensate new pass-through supply charge	$3.6	$1.2
Surgical procedures	Increase outpatient surgical procedure rates to compensate for the new system	$2.3	$0.8

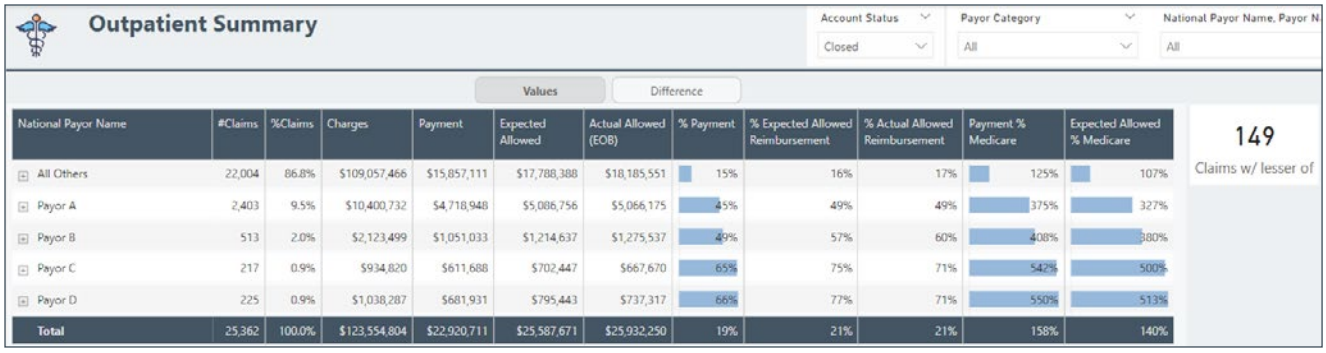
Monitoring

While the updated chargemaster is now in place to address the critical issues identified as a result of this analysis, monitoring the impact of these changes using PYA's Revenue Management Tool will be essential to ensure revenue levels will be rebalanced to historical levels (with allowable annual increase factors in place) and maintained. Future adjustments to chargemaster pricing levels may be necessary to refine the results of this initial analysis.

As part of the monitoring process, we were able to compare actual reimbursement on closed claims to expected reimbursement by payer to understand if certain payers or services should be monitored with respect to denials (partial or full claim denials) or underpayments.

PYA's Contract Management Tool (***Figure 5*** below) compares expected reimbursement to actual reimbursement on closed claims for outpatient services. Material differences could then be investigated with each payer. The tool also allows for a comparison of reimbursement to Medicare reimbursement to better understand the value of each key payer agreement.

Figure 5 – Expected reimbursement vs actual reimbursement (excerpt)



National Payor Name	#Claims	%Claims	Charges	Payment	Expected Allowed	Actual Allowed (EOB)	% Payment	% Expected Allowed Reimbursement	% Actual Allowed Reimbursement	Payment % Medicare	Expected Allowed % Medicare
All Others	22,004	86.8%	$109,057,466	$15,857,111	$17,788,388	$18,185,551	15%	16%	17%	125%	107%
Payor A	2,403	9.5%	$10,400,732	$4,718,948	$5,086,756	$5,066,175	45%	49%	49%	375%	327%
Payor B	513	2.0%	$2,123,499	$1,051,033	$1,214,637	$1,275,537	49%	57%	60%	408%	380%
Payor C	217	0.9%	$934,820	$611,688	$702,447	$667,670	65%	75%	71%	542%	500%
Payor D	225	0.9%	$1,038,287	$681,931	$795,443	$737,317	66%	77%	71%	550%	513%
Total	25,362	100.0%	$123,554,804	$22,920,711	$25,587,671	$25,932,250	19%	21%	21%	158%	140%

Contract yield can also be analyzed at the specific service level to understand and identify payment issues (see ***Figure 6*** below):

Figure 6 – Contract yield (excerpt)

Outpatient Summary

Claim Service Category	Charges	Payment	Expected Allowed	Payment LESS Expected Allowed	% Difference
Outpatient Procedures (360)	$25,822,766	$5,456,968	$5,823,574	($366,606)	-7%
Outpatient Procedures (361)	$7,416,425	$1,326,826	$1,541,861	($215,035)	-16%
Outpatient Procedures (481)	$1,761,096	$426,734	$581,991	($155,256)	-36%
Outpatient Procedures (75x)	$5,606,764	$1,119,152	$1,218,159	($99,008)	-9%
Outpatient Procedures (79x)	$215,590	$50,305	$50,980	($675)	-1%
Observation	$7,782,123	$836,090	$1,334,470	($498,380)	-60%
Emergency	$27,339,320	$4,523,404	$5,012,633	($489,228)	-11%
Multiple OP Services	$31,561,515	$6,061,914	$6,640,060	($578,146)	-10%
Cardiology	$1,673,997	$305,444	$327,379	($21,935)	-7%
Clinic	$1,236,393	$206,073	$211,645	($5,571)	-3%
CT Scan	$1,492,608	$166,158	$186,189	($20,031)	-12%
EKG/ECG Electrocardiogram	$84,639	$13,272	$14,318	($1,047)	-8%
Labor Room/Delivery	$11,694	$1,570	$3,105	($1,535)	-98%
Laboratory	$2,263,884	$299,132	$509,879	($210,747)	-70%
Laboratory Pathology	$84,522	$16,204	$16,205	($1)	-0%
Magnetic Resonance Technology (MRT)	$1,658,386	$221,342	$275,025	($53,682)	-24%
Medical/Surgical Supplies and Devices	$33,408	$4,352	$4,629	($277)	-6%

Conclusion

New EMR systems often bring unintended consequences. Regular monitoring and analysis post implementation can help highlight issues that may indicate the need for a process flow change, staff or physician education, or in certain instances, renegotiation of the contract terms with the payer. They can also reassure hospital leaders that operations are on track and running smoothly.

Monitoring gross revenue and net revenue is especially critical during an electronic system transition. Had the Client failed to monitor their headline charges, identify a possible unintended consequence, and ask PYA to assist in the analysis and monitoring of their gross charges during the transition, the Client would have risked a significant loss of net revenue.

Revenue Management Overwatch

Today's healthcare professionals face numerous roadblocks due to an ever-changing environment, increased pressure to maintain positive margins, retiring/changing workforce, etc. Through PYA's Revenue Management Overwatch, PYA brings nationally recognized subject-matter experts and world-class data intelligence tools such as our Revenue Management Tool and Contract Management Tool to assess our clients' current situations, identify tangible solutions to their problems, assist with implementation and remediation, monitor for ongoing optimal performance, and provide additional capacity when needed. PYA also helps manage denials, underpayments, and changes in benefit design, among other payer initiatives that impact revenue. Monitoring tools can be customized to meet the specific needs of the client, as demonstrated for this Client. Our team gives clients only what they need, when they need it, working alongside every step of the way. Learn more about PYA's Revenue Management Overwatch and how it can help you.