AI and Data Science in RCM

Current State of the Art in Revenue Cycle Management

CT AAHAM

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Agenda

- Introductions
- Definitions and State of the Art
- Case Study
- Return on Investment
- Questions and Answers

Introductions

Jeff Means

Jeff is a founder of Colburn Hill Group, a Revenue Cycle Management company. He has been in RCM for over 15 years, serving in Operating and Product Development roles. Jeff is a graduate of West Point and has an MBA from the University of Chicago.

[Poll Questions 1,2]

Definitions

- Predictive Analytics: the use of statistical techniques to predict future outcomes based on historical data
- Artificial Intelligence (AI): the capability for machines to independently make decisions based on perceived environment
- Machine Learning (ML): the ability for a software to learn and improve without being explicitly programmed
- Robotic Process Automation (RPA): using software to interact with information systems and perform tasks without human intervention

Common Use Cases

Predictive Analytics

- Propensity to Pay
- Price Transparency
- Readmissions

- Development tools and processes get cheaper
- Point Solutions are broadly available and generally accepted tools

Artificial Intelligence / Machine Learning

- Transcription Services
- Computer Assisted Coding

- The underlying data is often unreliable, not standardized, or not specific
- Modern workflows aren't integrated into legacy processes

Robotic Process Automation

- Claim Status Checking
- Eligibility Checks

Common Use Cases - Emerging

Predictive Analytics

- Predicted denials
- ROI (cost and return) for working accounts

Artificial Intelligence / Machine Learning

- Computer ***Automated*** Coding
- Reserve model audit
- Process Mining

Robotic Process Automation

- Host system workflows
- Appeals process
- “Attended” Automations

- Most products are unproven
- Most are not fully integrated workflows

Why is so much changing right now?

- Modern workflow means more granular data collection
- Cloud-based systems allow for real-time data analysis
- Platform providers (AWS, Google, Microsoft) enable embedded ML
- BI Tools (Tableau, PowerBI, Quicksight) enable customization
- RPA Platforms solve integration problems and are easy to program

… but …

- EHR and Billing Platforms haven’t yet adapted and the learning curve is steep

[Poll Questions 3, 4]

Case Study: Mid-Size Regional Med Center

Problems

- Big Data Caution!
- Previous Experience with Third Party Systems

Solutions

- Business Intelligence
- Workflow Support
- Automation

Outcomes

- Cost Reduction
- Denials Reduction
- Take the fight to the payer

Case Study: Mid-Size Regional Med Center

Problems:

- Sub-Optimal Follow Up Workflows in Cerner
- Need for a Robust Business Intelligence Capability
- Cost-Restricted Environment
- “Bait and Switch” Experience with Previous Vendors

Case Study: Mid-Size Regional Med Center

Solutions:

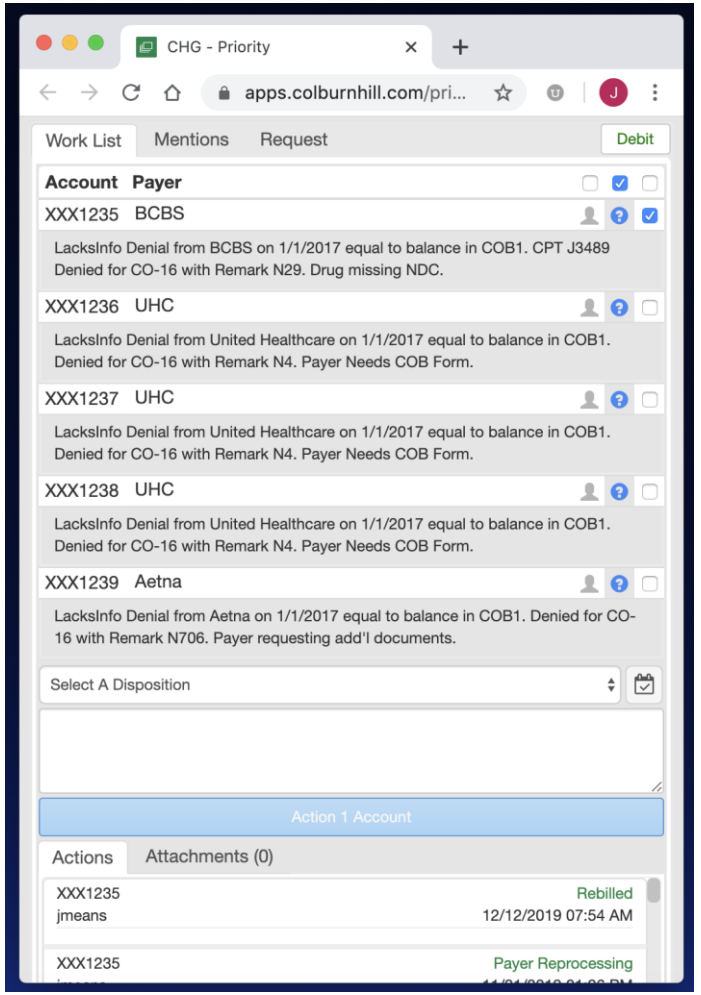
- Workflow with Data Capture
- Customizable Business Intelligence
- Defect Definition Algorithms
- Custom Automated Workflows based on ROI

Case Study: Mid-Size Regional Med Center

Workflow

- Customized Account Distribution
- Customized Prioritization Logic
- Customized Disposition Tracking
- Minimalist User Interface

Key: Track Everything!

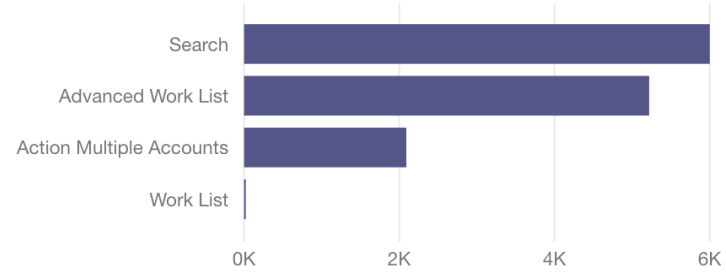


Disposition Analysis

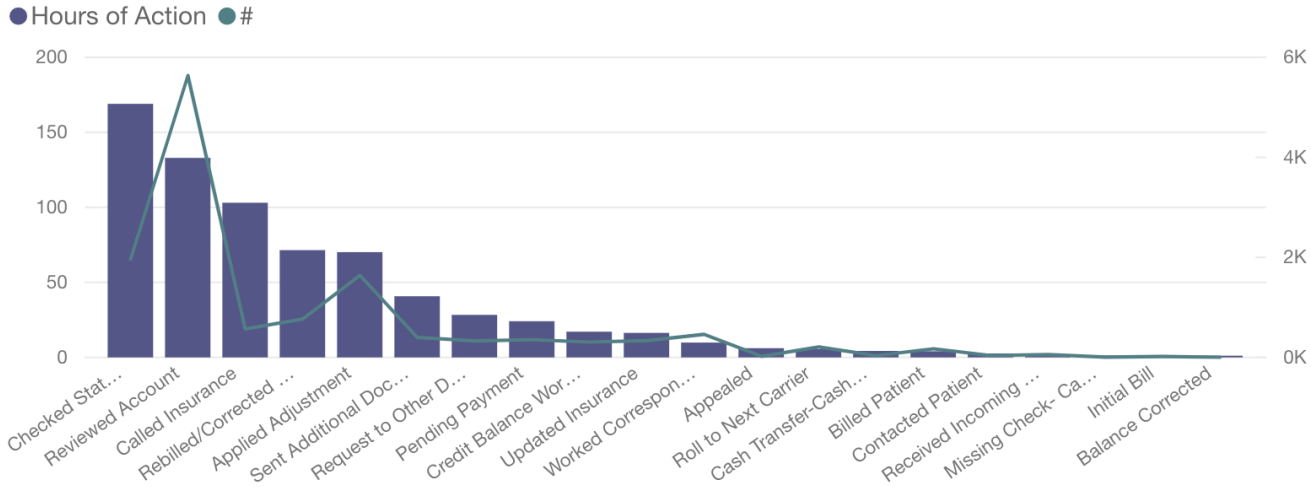
Action Dates: 12/2/2019 - 12/31/2019

Disposition	#	# as % of Total	Hours of Action	Action Hours as % of Total
Reviewed Account	5,637	42.33%	132.96	18.78%
Checked Status with Payer	1,965	14.76%	168.98	23.87%
Applied Adjustment	1,640	12.32%	70.14	9.91%
Rebilled/Corrected Claim	765	5.74%	71.48	10.10%
Called Insurance	567	4.26%	103.06	14.56%
Worked Correspondence	461	3.46%	9.87	1.39%
Sent Additional Documentation	399	3.00%	40.74	5.76%
Pending Payment	354	2.66%	24.10	3.40%
Updated Insurance	334	2.51%	16.32	2.31%
Request to Other Department	330	2.48%	28.33	4.00%
Credit Balance Worked	308	2.31%	17.12	2.42%
Roll to Next Carrier	208	1.56%	5.47	0.77%
Billed Patient	171	1.28%	4.11	0.58%
Received Incoming Call	57	0.43%	0.76	0.11%
Cash Transfer-Cash Posting	36	0.27%	4.32	0.61%
Contacted Patient	36	0.27%	2.64	0.37%
Appealed	21	0.16%	6.14	0.87%
Total	**13,316**	**100.00%**	**707.87**	**100.00%**

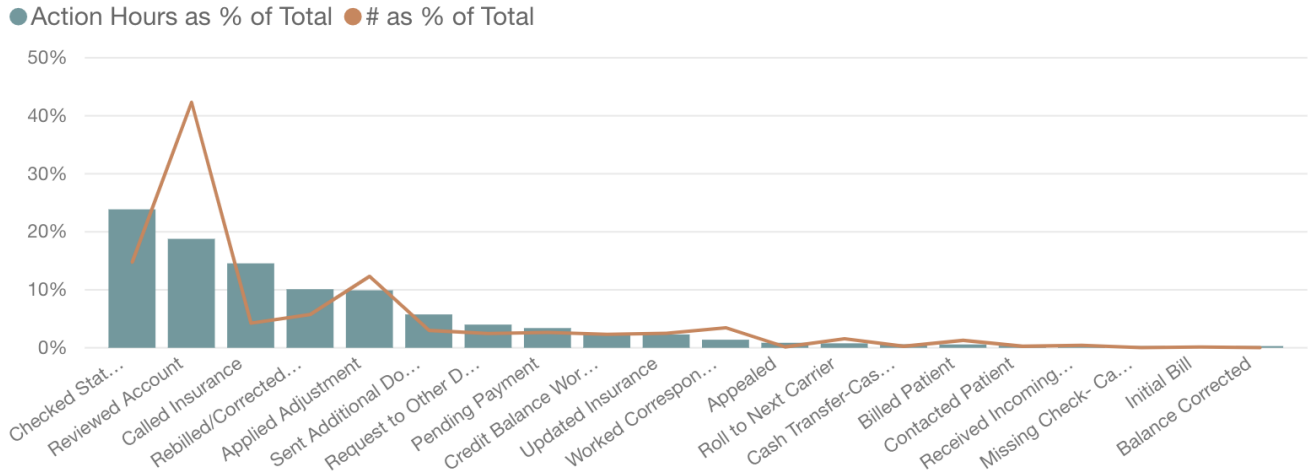
Volume by Action Source



Disposition Counts and Hours



Disposition % Counts and Hours

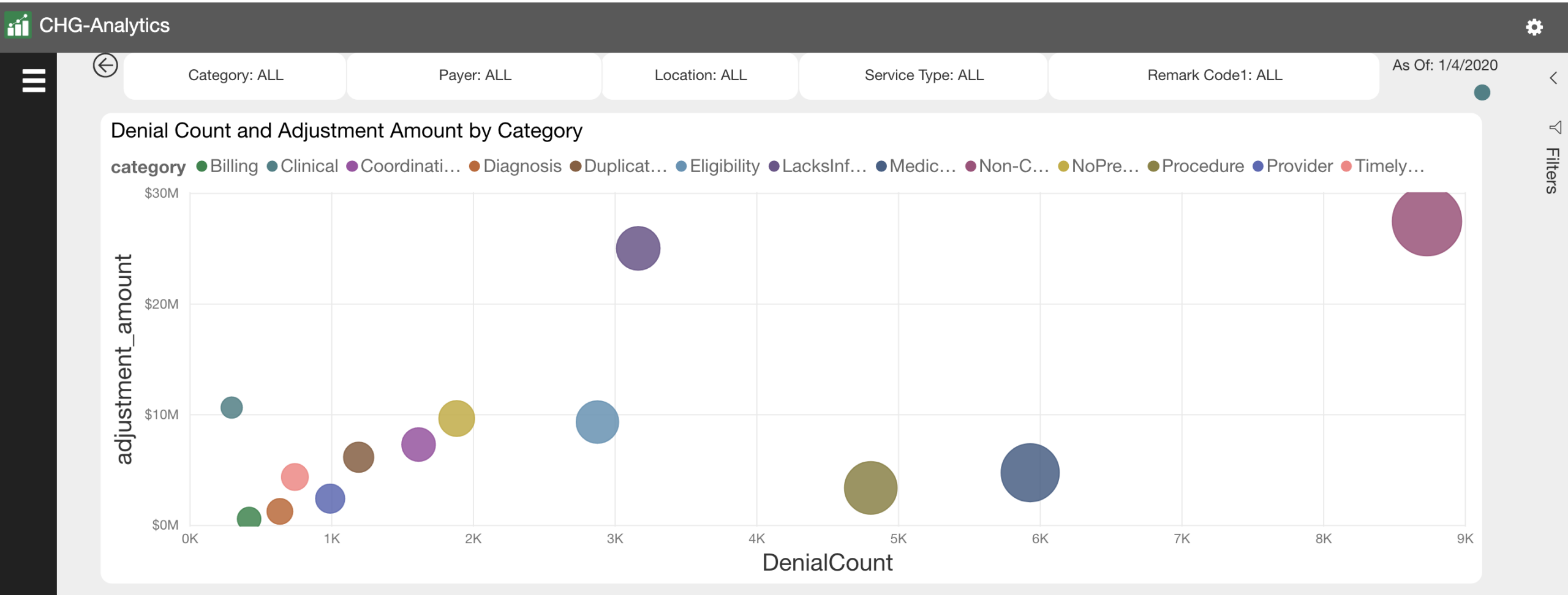


Case Study: Mid-Size Regional Med Center

Business Intelligence

- Manipulate large sets of data with drill down capability
- Integrate data from multiple sources
- Simple for users to slice data with filters
- Regression analysis readily accessible for super-users
- Simple for power users to customize, version control, and publish changes

Example Denials Report



[BI Video Demo]

Case Study: Mid-Size Regional Med Center

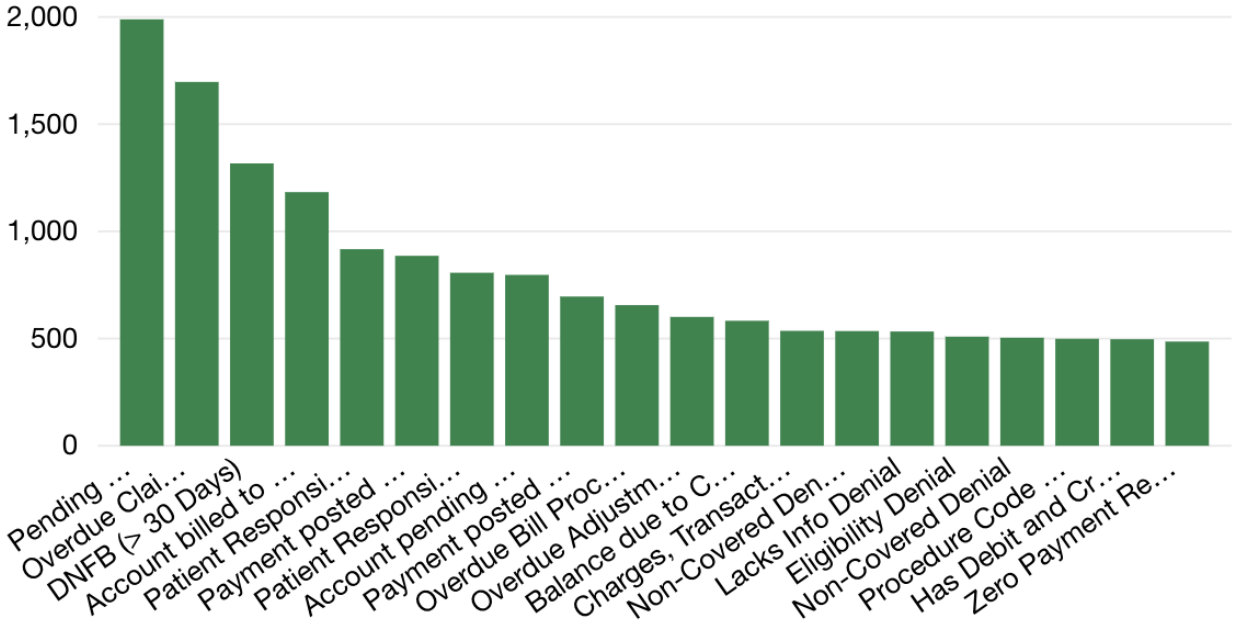
Predictive Analytics

- What is wrong with each account? What next action is required?
- Due for Work Date: Which accounts require manual intervention?
- Deadwood: Which accounts will “time out” (appeals and filing limits) if not worked in the next 30 days?
- Probability of Collections (expected return)

Case Study: Mid-Size Regional Med Center

Hints Distribution

Top 20 Hint Categories



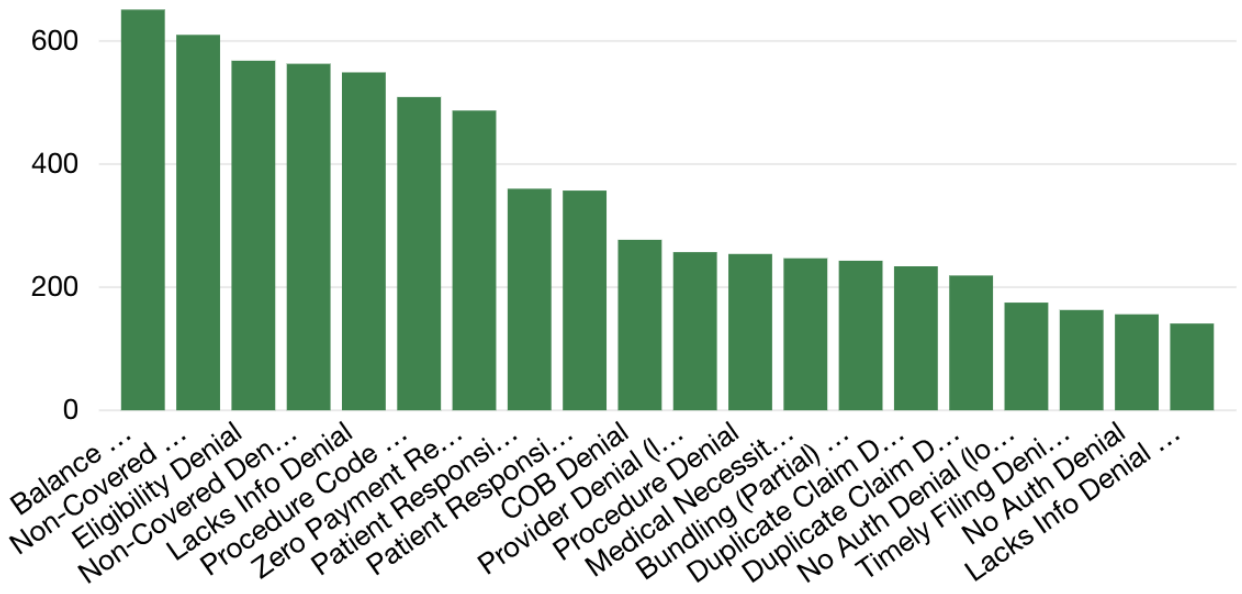
By Volume and Age Groups

hint category	volume	balance
Pending Time for Previous Action	1,989	$29,615,918.51
Overdue Claim Processing	1,697	$7,765,570.27
DNFB (> 30 Days)	1,317	$5,413,528.01
Account billed to payer > 45 days but not adjudicated	1,183	$8,915,605.10
Patient Responsibility in Insurance Balance	917	$146,209.95
Payment posted but remit does not explain remaining balance	886	$1,431,690.51
Patient Responsibility billed to Secondary < 45 - Pending Adjudication	807	$150,856.40
Account pending payer adjudication (billed < 45 days ago)	797	$4,474,125.01
Payment posted but remit does not explain balance	696	$355,142.65
Total	**28,117**	**$104,024,042.69**

Case Study: Mid-Size Regional Med Center

Denials Hints Distribution

Top 20 Hint Categories



By Volume and Age Groups

hint category	volume	balance
Balance due to Combination of Denials	651	$1,152,866.09
Non-Covered Denial	610	$1,492,445.61
Eligibility Denial	568	$648,379.57
Non-Covered Denial (low $)	563	$100,222.78
Lacks Info Denial	549	$1,881,208.64
Procedure Code Denial (low $)	509	$82,680.62
Zero Payment Received - Unknown Denial	487	$598,735.80
Patient Responsibility from Primary Insurance Denied by Secondary Insurance	360	$63,429.58
Patient Responsibility from Primary Insurance Denied by Secondary Insurance (from Crossover Claim)	357	$40,462.86
COB Denial	277	$692,675.74
Total	**9,172**	**$12,165,485.44**

Case Study: Mid-Size Regional Med Center

Robotic Process Automation (RPA)

- Claim Status Checks
- Eligibility Checks
  - Self Pay Audit
  - Pre-Bill Audit
- Insurance Re-Coup Updates
- Balance Transfers
- Automatic Adjustments
  - True Up Contractual Adjustments
  - Small Balance Adjustments
  - Un-recoverable Denials

- Integrate RPA and Manual Work Queues
- Consolidate Data across Systems
- Scheduled Automations
- Auditable/Accessible Activity Logs

[RPA Video Demo]

[RPA Video Demo]

Case Study: Mid-Size Regional Med Center

Outcomes

- Cost: Approaches range from freeware to millions of $ per year
- Return on Investment: Expect a 5:1 ROI
- Caveats and Advice:
  - Software is only as good as the implementation (garbage in, garbage out)
  - Start with low complexity and high repeatability
  - Avoid “partial” automation
  - Data studies often produce interesting conclusions … that are not actionable
  - AI Solutions tend to be more difficult to scale than traditional software
  - Remember: Correlation does NOT equal Cause

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