

Fraud Alerting and Detection of ACO Utilization



Gabe Orthous

DIRECTOR PERFORMANCE
& ANALYTICS

HCN Value-Based Services



- Federally Qualified Health Center Advocate with a passion for supporting and elevating the work of Health Centers (FQHCs).
- Gabe Orthous, healthcare information technology executive offering 25+ years of progressive experience as a value-based care strategic thinker and executor with a history of scaling and driving return on investment of complex HIT solutions. Solid industry knowledge with a wealth of expertise in business Intelligence used in concert with various analytics tools to drive actionable insights.
- He is particularly accomplished in helping large healthcare systems and insurer organizations develop analytics strategies that are highly effective in raising quality levels, improving patient outcomes and reducing costs.
- Currently an adjunct professor at Georgia State University Informatics department and former adjunct at Sacred Heart University Informatics Department. He is also a contributor as a SME for Cummings Graduate Institute for Behavioral Health Studies.
- Phd Candidate at Indiana Tech University – Global Healthcare Leadership DBA.

Foundational

What is an ACO?

- Accountable Care Organizations (ACOs) are groups of healthcare providers that **collaborate** to deliver high-quality care to Medicare patients while **reducing costs**.
- ACOs are incentivized to improve patient outcomes and **lower healthcare** spending.

Why Fraud is a Concern:

- Fraudulent activities can undermine the financial **stability** of ACOs.
- Fraud **increases healthcare costs** and reduces trust in the system.

Durable Medical Equipment (DME) Fraud

•**Example 1:** Billing for DME that was never delivered to the patient.

- Example: A provider submits claims for wheelchairs or CPAP machines that were never ordered or received by the patient.

•**Example 2:** Providing unnecessary or excessive DME to patients.

- Example: A patient is prescribed multiple high-cost items (e.g., power wheelchairs, orthotic braces) without medical justification.

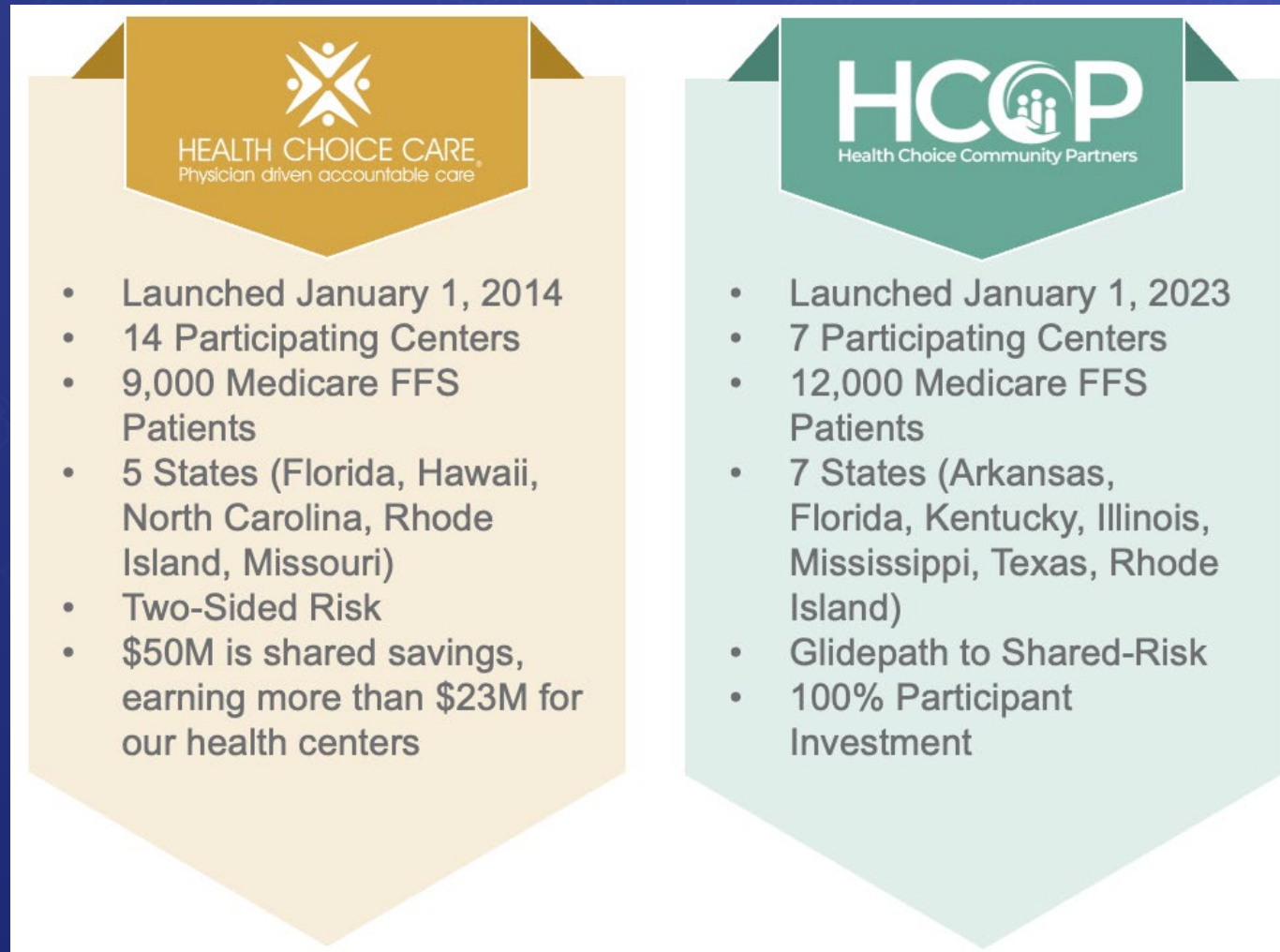
•**Example 3:** Kickbacks from DME suppliers.

- Example: A provider receives payments or incentives for referring patients to a specific DME supplier, even if the equipment is unnecessary.

•**Example 4:** Billing for custom-fitted DME when standard equipment was provided.

- Example: A provider bills for a custom-made orthotic brace but provides a pre-fabricated, off-the-shelf product.

100% FQHC Led MSSP ACO



Challenges in Fraud Detection

Complexity of Healthcare Data:

- **Large volumes of structured and unstructured data**
- **Variability in coding practices and documentation**

Evolving Fraud Tactics:

- **Fraudsters continuously adapt to avoid detection**

Regulatory Compliance:

- **Balancing fraud detection with patient privacy (e.g., HIPAA compliance)**

False Positives:

- **High rates of false alerts can overwhelm investigators**

Fraud Detection Strategies and Tools

Data Analytics:

- Use of predictive analytics to identify unusual patterns in claims data
- Example: Detecting spikes in specific procedures or services

Machine Learning Models:

- Supervised learning to classify fraudulent vs. non-fraudulent claims.
- Unsupervised learning to detect anomalies in utilization patterns

Real-Time Monitoring:

- Implementing systems to flag suspicious activities as they occur
- Automated tools to streamline audits and investigations

Collaborative Efforts (AIC):

- Sharing data and insights across ACOs and payers to identify fraud trends

Best Practices for Fraud Prevention

Implement Robust Data Governance:

- **Ensure data accuracy, consistency, and security**

Leverage Advanced Analytics:

- **Continuously monitor utilization patterns for anomalies**

Educate Providers and Staff:

- **Train teams to recognize and report potential fraud**

Foster Collaboration:

- **Work with payers, regulators, and other ACOs to share fraud suspecting intelligence**

Conduct Regular Audits:

- **Proactively review claims and utilization data for irregularities**

External Resources (That I know of)

IBM Watson Health Fraud Detection

1. IBM offers advanced analytics and AI-driven tools to detect healthcare fraud, waste, and abuse.
2. [IBM Watson Health Fraud Detection](#)

SAS Fraud Framework for Healthcare

1. SAS provides a comprehensive framework for detecting fraudulent activities in healthcare claims and utilization.
2. [SAS Fraud Framework for Healthcare](#)

FraudScope

1. A cloud-based platform that uses AI and machine learning to detect healthcare fraud, waste, and abuse.
2. [FraudScope](#)

NICE Actimize Healthcare Fraud Detection

1. A solution designed to identify and prevent healthcare fraud using predictive analytics.
2. [NICE Actimize Healthcare Fraud Detection](#)

LexisNexis Risk Solutions

1. Offers tools for identity verification and fraud prevention in healthcare.
2. [LexisNexis Healthcare Fraud Solutions](#)

..among many others

External Resources

1. Centers for Medicare & Medicaid Services (CMS) Fraud Prevention

1. CMS provides resources and guidelines for preventing fraud, waste, and abuse in Medicare and Medicaid programs.
2. [CMS Fraud Prevention](#)

2. Office of Inspector General (OIG) Compliance Resources

1. The OIG offers compliance guidelines, fraud alerts, and toolkits for healthcare providers.
2. [OIG Compliance Resources](#)

3. Health Insurance Portability and Accountability Act (HIPAA)

1. HIPAA regulations include provisions for preventing healthcare fraud and protecting patient data.
2. [HIPAA Guidelines](#)

4. False Claims Act (FCA)

1. The FCA is a federal law that imposes liability on individuals and companies that defraud government programs, including Medicare and Medicaid.
2. [False Claims Act Overview](#)

5. National Health Care Anti-Fraud Association (NHCAA)

1. NHCAA provides resources, training, and best practices for combating healthcare fraud.
2. [NHCAA Resources](#)

Creating a Fraud Flagging system

- Morgan Power- mpower@clarksonregional.com



Who are Transforming Healthcare?

A Clarkson Regional Health Services Company

We

- *Provide insight and analytics to Think ACO*
- *Focus on Insight and actionable data*
- *Have Data and Analytic functions*
- *Have helped other ACOs in our Region*





Agenda

Creating a Fraud Flagging system

- Comparing to Significant, Anomalous, and Highly Suspect -
- HCPCS / CPT/ DRG Level
 - Restructured BETOS Category/ Subcategory/ Family
 - Count of Codes / Sum of Dollars
 - Rolling 12 Month Average / Standard Deviation
- By percentage of Month / Dollars by Restructured BETOS Subcategory
- Control Charts / 3 Standard Deviations from the Mean
- What we found
- Algorithm



Significant, Anomalous, and Highly Suspect Billing Activity

HCPCS Codes A4352, A4353

Looking at one of those codes at HCPCS Code Level

Count - # of Codes in that Month

Average Count – Average Monthly Count of activity over the last 12 Months

Standard Deviation Count - Standard Deviation of Count over the last 12 Months

Threshold Count - Average Count + (3 x Standard Deviation Count)

Sum – Sum of Allowed Dollars (Paid if Part A)

Average Sum – Average Monthly Sum over the last 12 Months

Standard Deviation Sum - Standard Deviation of Sum over the last 12 Months

Threshold Sum - Average Sum + (3 x Standard Deviation Sum)

Trigger – If the Count or Sum is greater than its Threshold => Trigger

Month	Trigger	Count	Average Count	Threshold Count	Standard Deviation Count	Sum	Average Sum	Threshold Sum	Standard Deviation Sum
1/1/2022		1				\$ 1,275			
2/1/2022		1				\$ 1,275			
3/1/2022		1				\$ 1,275			
4/1/2022		1				\$ 1,275			
5/1/2022		1				\$ 1,275			
6/1/2022		1				\$ 1,275			
7/1/2022		1				\$ 1,275			
8/1/2022		1				\$ 1,275			
9/1/2022		1				\$ 1,275			
10/1/2022		0				\$ -			
11/1/2022		1				\$ 1,275			
12/1/2022		0				\$ -			
1/1/2023		4				\$ 7,456			
2/1/2023		4				\$ 7,456			
3/1/2023	COUNT	13	2.4	12.8	3.47	\$ 17,149	\$ 3,522	\$ 18,036	\$ 4,838
4/1/2023		14	3.5	17.7	4.73	\$ 18,679	\$ 4,972	\$ 24,176	\$ 6,401
5/1/2023		59	8.3	56.7	16.11	\$ 109,972	\$ 14,030	\$ 103,518	\$ 29,829
6/1/2023		90	15.8	99	27.74	\$ 167,744	\$ 27,903	\$ 183,716	\$ 51,938
7/1/2023		139	27.3	158.8	43.85	\$ 263,080	\$ 49,720	\$ 298,950	\$ 83,077
8/1/2023		138	38.7	197.8	53.06	\$ 261,212	\$ 71,381	\$ 373,863	\$ 100,827
9/1/2023		131	49.5	223.5	58	\$ 239,776	\$ 91,256	\$ 419,524	\$ 109,423
10/1/2023		102	57.9	232.7	58.28	\$ 194,736	\$ 107,378	\$ 438,431	\$ 110,351
11/1/2023		86	65.1	234.8	56.56	\$ 168,680	\$ 121,435	\$ 444,259	\$ 107,608
12/1/2023		31	67.6	231.1	54.52	\$ 57,768	\$ 126,142	\$ 437,645	\$ 103,834
1/1/2024		38	70.8	226.3	51.85	\$ 81,100	\$ 132,901	\$ 428,574	\$ 98,558
2/1/2024		35	73.3	221.7	49.45	\$ 75,368	\$ 138,560	\$ 419,413	\$ 93,618
3/1/2024		3	73.3	221.9	49.56	\$ 5,580	\$ 138,404	\$ 419,864	\$ 93,820
4/1/2024		10	73	222.5	49.84	\$ 26,386	\$ 139,173	\$ 418,004	\$ 92,943
5/1/2024		0	71.8	225.5	51.23	\$ -	\$ 137,617	\$ 422,334	\$ 94,906
6/1/2024		0	66.9	230.2	54.44	\$ -	\$ 128,452	\$ 432,180	\$ 101,243
7/1/2024		0	59.4	228.1	56.24	\$ -	\$ 114,474	\$ 429,685	\$ 105,070
8/1/2024		0	47.8	203.7	51.96	\$ -	\$ 92,550	\$ 384,365	\$ 97,272
9/1/2024		1	36.4	170.6	44.73	\$ 860	\$ 70,855	\$ 322,718	\$ 83,954

Trigger on Count 3/1/23

Count > Threshold

Count > 3 SD over rolling 12 Month Average



Aggregating by Restructured BETOS Code

To BETOS Family Description -
Intermittent Urinary Catheter

There is no Trigger on Count in March '23

However, with aggregation there is a
loss of precision

The 2024 Restructured BETOS Family Description
- Intermittent Urinary Catheter
Contains 10 HCPCS / CPTCodes

RBCS - Restructured BETOS Classification System
BETOS - Berenson-Eggers Type of Service

Month	Count	Average Count	Threshold Count	Standard Deviation Count	Sum	Average Sum	Threshold Sum	Standard Deviation Sum
1/1/2022	16				\$ 12,030			
2/1/2022	13				\$ 7,831			
3/1/2022	17				\$ 7,999			
4/1/2022	19				\$ 11,502			
5/1/2022	15				\$ 7,194			
6/1/2022	22				\$ 12,124			
7/1/2022	16				\$ 11,961			
8/1/2022	16				\$ 7,981			
9/1/2022	16				\$ 7,769			
10/1/2022	14				\$ 7,806			
11/1/2022	21				\$ 14,239			
12/1/2022	13				\$ 6,497			
1/1/2023	49				\$ 67,962			
2/1/2023	53				\$ 71,214			
3/1/2023	66	28.1	81.2	17.71	\$ 85,087	\$ 26,611	\$ 113,447	\$ 28,945
4/1/2023	75	32.9	99.1	22.05	\$ 104,026	\$ 34,613	\$ 142,030	\$ 35,806
5/1/2023	128	42	145.6	34.54	\$ 201,073	\$ 50,411	\$ 225,349	\$ 58,313
6/1/2023	149	53.2	188.8	45.21	\$ 250,427	\$ 70,680	\$ 309,864	\$ 79,728
7/1/2023	226	70.2	267.4	65.76	\$ 366,489	\$ 100,211	\$ 440,666	\$ 113,485
8/1/2023	189	84.6	301.3	72.25	\$ 336,166	\$ 127,228	\$ 513,892	\$ 128,888
9/1/2023	185	98.7	324.5	75.29	\$ 314,407	\$ 152,763	\$ 557,982	\$ 135,073
10/1/2023	153	110.1	330.5	73.47	\$ 258,399	\$ 173,649	\$ 570,635	\$ 132,329
11/1/2023	99	117.2	323.1	68.65	\$ 175,858	\$ 187,654	\$ 560,093	\$ 124,147
12/1/2023	50	119.6	317.6	66	\$ 71,839	\$ 192,454	\$ 549,206	\$ 118,917
1/1/2024	63	123.8	307.1	61.13	\$ 100,237	\$ 200,265	\$ 530,856	\$ 110,197
2/1/2024	50	123.8	307	61.04	\$ 87,829	\$ 201,921	\$ 527,619	\$ 108,566
3/1/2024	20	121.1	314.3	64.4	\$ 21,301	\$ 197,761	\$ 538,976	\$ 113,738
4/1/2024	24	117.6	321.1	67.85	\$ 37,552	\$ 193,800	\$ 547,270	\$ 117,823
5/1/2024	16	112.7	329	72.12	\$ 14,819	\$ 186,366	\$ 561,157	\$ 124,930
6/1/2024	18	103.5	329.8	75.44	\$ 11,856	\$ 170,598	\$ 566,845	\$ 132,082
7/1/2024	14	92.3	322.5	76.75	\$ 7,428	\$ 150,348	\$ 555,331	\$ 134,994
8/1/2024	19	75	272.4	65.78	\$ 13,555	\$ 120,937	\$ 481,074	\$ 120,046
9/1/2024	13	60.3	230	56.54	\$ 10,720	\$ 93,817	\$ 399,455	\$ 101,880



Aggregating by Restructured BETOS Code

BETOS Subcategory
Description - Orthotic Devices

There is no Trigger on Count in March '23

The 2024 Restructured BETOS Subcategory
Description - Orthotic Devices
Contains 1264 HCPCS / CPTCodes

Month	Count	Average Count	Threshold Count	Standard Deviation Count	Sum	Average Sum	Threshold Sum	Standard Deviation Sum
1/1/2022	140				\$ 45,550			
2/1/2022	142				\$ 30,793			
3/1/2022	220				\$ 50,551			
4/1/2022	174				\$ 59,272			
5/1/2022	155				\$ 32,647			
6/1/2022	184				\$ 39,741			
7/1/2022	183				\$ 41,717			
8/1/2022	202				\$ 37,758			
9/1/2022	220				\$ 51,357			
10/1/2022	152				\$ 32,848			
11/1/2022	177				\$ 45,689			
12/1/2022	185				\$ 42,747			
1/1/2023	178				\$ 99,449			
2/1/2023	174				\$ 91,891			
3/1/2023	252	204.7	288.5	27.95	\$127,152	\$ 62,735	\$ 151,127	\$ 29,464
4/1/2023	220	204.7	288.5	27.95	\$177,410	\$ 73,306	\$ 205,800	\$ 44,165
5/1/2023	289	214.3	330.9	38.89	\$233,835	\$ 87,853	\$ 278,779	\$ 63,642
6/1/2023	299	226.3	363.1	45.62	\$277,057	\$ 108,221	\$ 353,264	\$ 81,681
7/1/2023	372	241.9	432.2	63.42	\$401,887	\$ 138,400	\$ 482,151	\$ 114,584
8/1/2023	358	256.5	472.9	72.12	\$365,880	\$ 165,413	\$ 551,521	\$ 128,702
9/1/2023	350	268.8	501.8	77.65	\$341,032	\$ 190,686	\$ 591,274	\$ 133,529
10/1/2023	280	273.8	506.7	77.62	\$281,685	\$209,880	\$ 602,473	\$ 130,864
11/1/2023	245	281.6	496.4	71.61	\$212,969	\$224,890	\$ 589,748	\$ 121,619
12/1/2023	203	283.8	492	69.43	\$138,530	\$232,627	\$ 574,009	\$ 113,794
1/1/2024	206	285.5	488.6	67.71	\$132,991	\$240,147	\$ 554,629	\$ 104,827
2/1/2024	182	285.8	487.7	67.3	\$127,997	\$242,526	\$ 549,493	\$ 102,322
3/1/2024	165	285.1	490.1	68.34	\$ 48,718	\$238,929	\$ 561,521	\$ 107,531
4/1/2024	183	279.3	494.9	71.87	\$ 78,834	\$234,902	\$ 570,240	\$ 111,779
5/1/2024	174	275.5	500.4	74.95	\$ 49,090	\$224,209	\$ 586,754	\$ 120,849
6/1/2024	142	263.3	503.8	80.19	\$ 33,031	\$207,475	\$ 596,397	\$ 129,641
7/1/2024	156	251.3	496.3	81.66	\$ 37,503	\$ 187,512	\$ 587,826	\$ 133,438
8/1/2024	147	232.6	451.2	72.89	\$ 59,171	\$ 158,952	\$ 511,013	\$ 117,353
9/1/2024	64	208.1	418.9	70.28	\$ 20,455	\$ 130,167	\$ 435,125	\$ 101,652



Aggregating by Restructured BETOS Code

BETOS Category Description -
DME

There is no Trigger on Count in March '23

The 2024 Restructured BETOS Category
Description - DME
Contains 3196 HCPCS / CPT Codes

Month	Count	Average Count	Threshold Count	Standard Deviation Count	Sum	Average Sum	Threshold Sum	Standard Deviation Sum
1/1/2022	1979				\$ 193,727			
2/1/2022	1908				\$ 194,316			
3/1/2022	2210				\$ 213,782			
4/1/2022	2018				\$ 251,664			
5/1/2022	2038				\$ 249,066			
6/1/2022	2154				\$ 241,319			
7/1/2022	2031				\$ 284,348			
8/1/2022	2334				\$ 293,480			
9/1/2022	2178				\$ 285,430			
10/1/2022	2070				\$ 300,371			
11/1/2022	2034				\$ 312,346			
12/1/2022	2250				\$ 262,211			
1/1/2023	1910				\$ 321,954			
2/1/2023	1889				\$ 273,030			
3/1/2023	2102	2268.2	2654.5	128.79	\$ 293,109	\$ 298,509	\$ 390,859	\$ 30,783
4/1/2023	1789	2233.1	2678.7	148.53	\$ 333,461	\$ 308,482	\$ 394,253	\$ 28,590
5/1/2023	2112	2240.9	2686.5	148.53	\$ 401,054	\$ 320,932	\$ 444,998	\$ 41,355
6/1/2023	2128	2248.4	2695.7	149.09	\$ 425,230	\$ 335,612	\$ 491,851	\$ 52,080
7/1/2023	2074	2241.8	2683.4	147.21	\$ 587,328	\$ 364,446	\$ 632,317	\$ 89,290
8/1/2023	2405	2272.9	2792.9	173.33	\$ 602,653	\$ 390,971	\$ 733,083	\$ 114,037
9/1/2023	2156	2258.1	2737	159.63	\$ 508,772	\$ 408,912	\$ 765,784	\$ 118,957
10/1/2023	2191	2259.2	2740.1	160.3	\$ 471,166	\$ 424,390	\$ 778,793	\$ 118,134
11/1/2023	1963	2250.3	2741.9	163.87	\$ 359,648	\$ 429,330	\$ 775,610	\$ 115,427
12/1/2023	2121	2257.5	2748.7	163.73	\$ 313,392	\$ 429,417	\$ 775,508	\$ 115,363
1/1/2024	1861	2225.1	2724.2	166.36	\$ 287,572	\$ 431,531	\$ 770,824	\$ 113,098
2/1/2024	1810	2216.8	2743.6	175.63	\$ 273,031	\$ 427,454	\$ 777,285	\$ 116,610
3/1/2024	1885	2216.4	2744.2	175.93	\$ 189,945	\$ 420,530	\$ 797,768	\$ 125,746
4/1/2024	1929	2202	2735.6	177.87	\$ 237,358	\$ 415,884	\$ 806,283	\$ 130,133
5/1/2024	1821	2204.7	2727.9	174.4	\$ 173,942	\$ 402,591	\$ 829,317	\$ 142,242
6/1/2024	1832	2181.3	2725.1	181.26	\$ 172,908	\$ 383,579	\$ 839,713	\$ 152,045
7/1/2024	1892	2161.7	2703.7	180.66	\$ 199,821	\$ 364,795	\$ 832,955	\$ 156,054
8/1/2024	1721	2132.3	2714	193.9	\$ 177,193	\$ 330,617	\$ 756,599	\$ 141,994
9/1/2024	923	2008.8	2951.1	314.11	\$ 81,089	\$ 287,153	\$ 657,377	\$ 123,408



BETOS Subcategory Description

HCPCS / CPT/ DRG – 7814

RBCS
Family - 169

Subcategory – 53

Category - 11

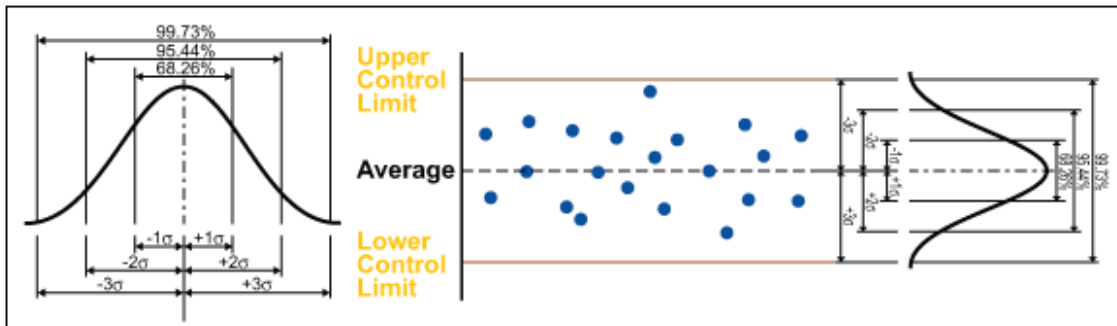
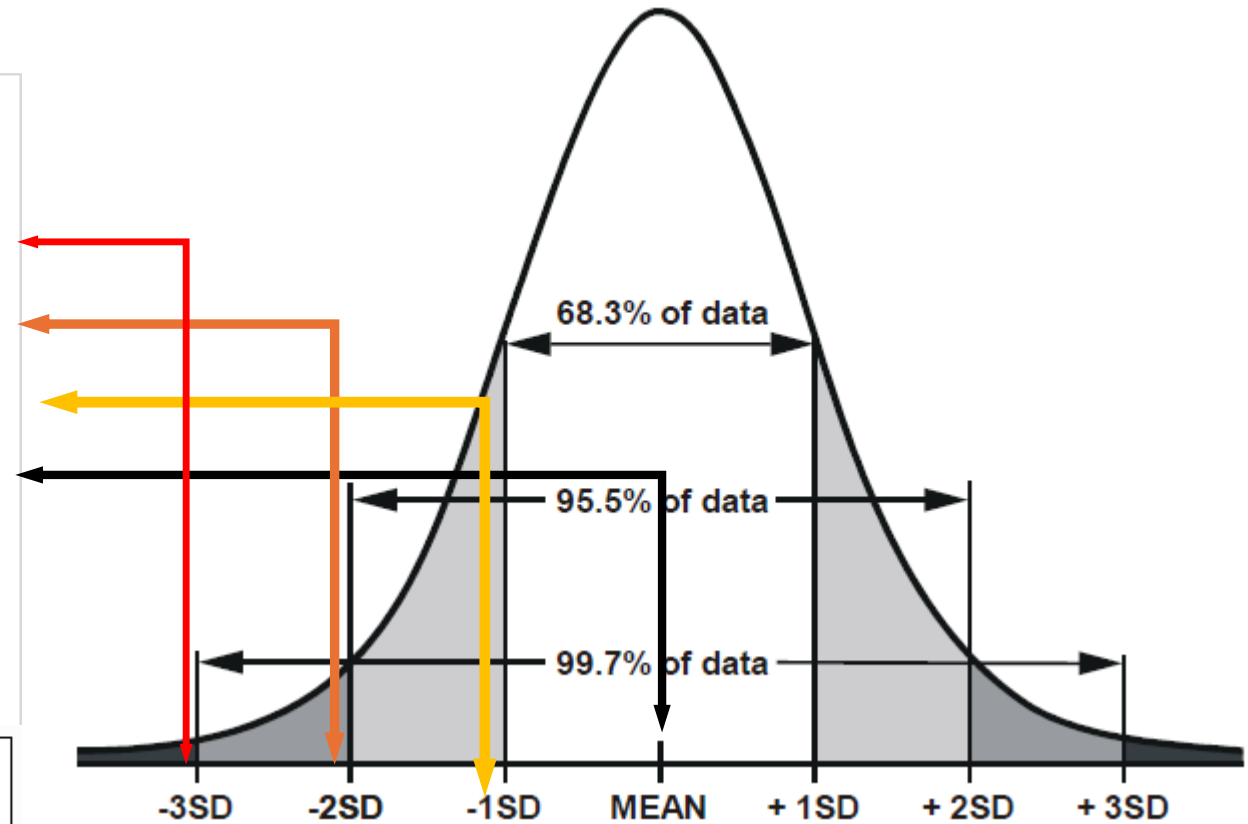
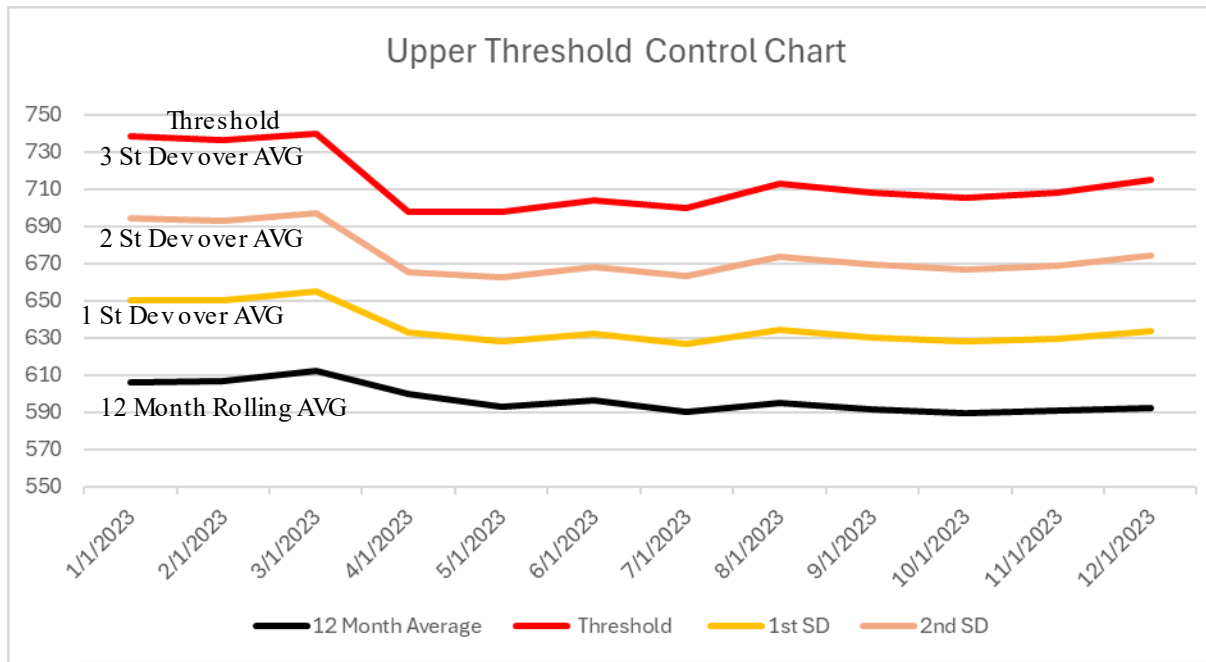
We need a way to highlight
the more unusual changes

Sum of SUM PER MONTH	Month																	
Month	7/1/2022	8/1/2022	9/1/2022	10/1/2022	11/1/2022	12/1/2022	1/1/2023	2/1/2023	3/1/2023	4/1/2023	5/1/2023	6/1/2023	7/1/2023	8/1/2023	9/1/2023	10/1/2023	11/1/2023	12/1/2023
RBCS_SubCat - Ambulance	1.03%	0.71%	0.77%	0.69%	0.71%	1.04%	0.97%	0.92%	0.93%	1.00%	1.05%	0.70%	1.03%	0.82%	0.81%	0.74%	0.83%	0.99%
RBCS_SubCat - Anatomic Pathology	0.66%	0.61%	0.56%	0.68%	0.58%	0.51%	0.63%	0.56%	0.61%	0.67%	0.51%	0.61%	0.70%	0.54%	0.61%	0.53%	0.64%	0.51%
RBCS_SubCat - Anesthesia	0.98%	1.06%	0.89%	0.84%	0.82%	0.74%	0.90%	0.92%	0.94%	0.87%	0.81%	0.88%	0.88%	0.84%	0.83%	0.80%	0.85%	0.70%
RBCS_SubCat - Behavioral Health Services	0.45%	0.49%	0.45%	0.45%	0.46%	0.39%	0.44%	0.37%	0.38%	0.42%	0.38%	0.38%	0.37%	0.41%	0.41%	0.39%	0.39%	0.37%
RBCS_SubCat - Breast	0.25%	0.40%	0.42%	0.09%	0.22%	0.20%	0.41%	0.19%	0.22%	0.11%	0.07%	0.14%	0.14%	0.09%	0.11%	0.18%	0.11%	0.12%
RBCS_SubCat - Cardiology	0.33%	0.28%	0.27%	0.26%	0.34%	0.31%	0.31%	0.28%	0.28%	0.26%	0.28%	0.29%	0.25%	0.26%	0.24%	0.23%	0.36%	0.30%
RBCS_SubCat - Cardiovascular	4.03%	2.43%	2.13%	3.38%	1.93%	2.49%	3.81%	2.11%	3.02%	2.49%	3.05%	2.27%	1.91%	2.97%	2.40%	1.42%	1.67%	2.58%
RBCS_SubCat - Care Management/Coordination	0.17%	0.20%	0.25%	0.21%	0.21%	0.18%	0.20%	0.20%	0.22%	0.28%	0.29%	0.34%	0.31%	0.56%	0.78%	0.77%	1.00%	1.14%
RBCS_SubCat - Chemotherapy	5.09%	4.90%	4.99%	5.34%	5.99%	5.69%	5.64%	5.72%	7.55%	6.62%	6.66%	6.10%	6.68%	5.03%	4.90%	4.38%	4.49%	5.11%
RBCS_SubCat - Critical Care Services	0.13%	0.12%	0.09%	0.12%	0.16%	0.17%	0.17%	0.13%	0.16%	0.09%	0.08%	0.16%	0.15%	0.16%	0.10%	0.16%	0.16%	0.19%
RBCS_SubCat - CT Scan	1.32%	1.08%	0.98%	1.36%	1.26%	1.20%	1.05%	1.15%	1.09%	1.06%	1.21%	1.28%	1.20%	1.09%	1.04%	0.92%	1.08%	1.20%
RBCS_SubCat - Dialysis	0.20%	0.19%	0.20%	0.20%	0.18%	0.18%	0.25%	0.19%	0.15%	0.16%	0.15%	0.17%	0.17%	0.18%	0.17%	0.18%	0.17%	0.16%
RBCS_SubCat - Digestive/Gastrointestinal	1.95%	2.06%	1.80%	1.68%	1.58%	1.60%	1.92%	1.85%	1.97%	1.76%	1.71%	1.96%	2.15%	1.87%	2.04%	1.89%	2.01%	1.74%
RBCS_SubCat - Drugs Administered Through DME	0.20%	0.18%	0.24%	0.22%	0.33%	0.20%	0.71%	0.21%	0.19%	0.19%	0.16%	0.13%	0.24%	0.15%	0.21%	0.24%	0.25%	0.21%
RBCS_SubCat - E&M - Miscellaneous	0.05%	0.05%	0.06%	0.06%	0.06%	0.06%	0.04%	0.04%	0.03%	0.04%	0.04%	0.04%	0.03%	0.03%	0.03%	0.03%	0.07%	0.08%
RBCS_SubCat - Emergency Department Services	2.42%	1.99%	2.00%	1.94%	2.06%	2.05%	1.98%	2.03%	1.80%	1.71%	1.81%	1.76%	1.94%	1.74%	1.76%	1.39%	1.74%	1.71%
RBCS_SubCat - Enteral and Parenteral	0.02%	0.04%	0.04%	0.02%	0.05%	0.03%	0.05%	0.03%	0.07%	0.18%	0.16%	0.13%	0.13%	0.03%	0.12%	0.08%	0.04%	0.04%
RBCS_SubCat - Eye	2.17%	2.66%	1.88%	2.04%	2.41%	1.68%	2.00%	1.53%	1.60%	2.02%	1.83%	1.82%	2.39%	1.81%	1.85%	1.97%	1.78%	1.75%
RBCS_SubCat - General Laboratory	1.57%	1.56%	1.58%	1.55%	1.58%	1.57%	1.39%	1.51%	1.57%	1.61%	1.69%	1.54%	1.37%	1.43%	1.44%	1.62%	1.62%	1.46%
RBCS_SubCat - Hematology	0.05%	0.10%	0.05%	0.04%	0.08%	0.09%	0.05%	0.06%	0.09%	0.07%	0.04%	0.09%	0.16%	0.11%	0.11%	0.16%	0.15%	0.08%
RBCS_SubCat - Home Services	0.12%	0.10%	0.11%	0.12%	0.15%	0.15%	0.23%	0.19%	0.20%	0.19%	0.22%	0.24%	0.18%	0.21%	0.23%	0.20%	0.26%	0.16%
RBCS_SubCat - Hospice	0.85%	0.66%	0.65%	0.90%	0.94%	0.72%	1.03%	1.14%	1.07%	1.07%	1.06%	0.81%	0.69%	0.63%	0.97%	0.78%	0.69%	0.59%
RBCS_SubCat - Hospital	29.64%	28.92%	28.99%	25.48%	30.17%	34.87%	30.62%	31.88%	28.28%	31.28%	28.02%	27.99%	25.62%	30.41%	28.86%	31.44%	30.39%	35.62%
RBCS_SubCat - Hospital Beds	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
RBCS_SubCat - Hospital Inpatient Services	1.61%	1.40%	1.37%	1.46%	1.30%	1.57%	1.76%	1.66%	1.94%	1.82%	1.56%	1.55%	1.53%	1.72%	1.50%	1.79%	1.87%	1.87%
RBCS_SubCat - Imaging - Miscellaneous	0.21%	0.20%	0.21%	0.23%	0.19%	0.17%	0.19%	0.19%	0.18%	0.17%	0.21%	0.21%	0.20%	0.21%	0.18%	0.17%	0.18%	0.18%
RBCS_SubCat - Injections and Infusions (nononcologic)	9.87%	9.17%	10.71%	13.97%	10.87%	10.02%	8.67%	9.23%	9.39%	8.45%	9.82%	10.22%	9.79%	8.37%	10.96%	11.99%	10.93%	8.51%
RBCS_SubCat - Magnetic Resonance	0.67%	0.67%	0.59%	0.67%	0.56%	0.58%	0.63%	0.52%	0.56%	0.51%	0.69%	0.66%	0.66%	0.63%	0.50%	0.50%	0.60%	0.58%
RBCS_SubCat - Medical/Surgical Supplies	0.99%	0.72%	0.85%	1.03%	0.93%	0.33%	0.43%	0.72%	0.59%	0.28%	0.40%	0.16%	0.43%	0.24%	0.60%	0.33%	0.19%	0.44%
RBCS_SubCat - Molecular Testing	0.71%	0.79%	0.79%	0.68%	0.99%	1.08%	0.59%	0.75%	0.88%	0.59%	0.62%	0.71%	0.86%	0.76%	0.76%	0.60%	0.58%	0.97%
RBCS_SubCat - Musculoskeletal	5.03%	7.37%	8.20%	6.86%	5.52%	5.31%	6.58%	8.85%	9.52%	6.53%	6.79%	6.10%	6.53%	6.27%	6.55%	7.91%	7.32%	5.34%
RBCS_SubCat - Neurologic	0.22%	0.23%	0.15%	0.20%	0.27%	0.21%	0.20%	0.20%	0.16%	0.25%	0.22%	0.22%	0.19%	0.18%	0.14%	0.12%	0.14%	0.22%
RBCS_SubCat - Nuclear	0.98%	0.85%	1.29%	0.90%	0.67%	0.82%	0.80%	1.01%	0.59%	0.66%	0.64%	0.59%	0.63%	0.65%	0.62%	0.64%	0.85%	0.60%
RBCS_SubCat - Nursing Facility Services	0.27%	0.29%	0.29%	0.34%	0.27%	0.27%	0.28%	0.35%	0.35%	0.36%	0.34%	0.33%	0.29%	0.25%	0.24%	0.26%	0.29%	0.30%
RBCS_SubCat - Observation Care Services	0.18%	0.15%	0.19%	0.16%	0.12%	0.15%	0.01%	0.01%	0.04%	0.01%	0.01%	0.01%	0.06%	0.03%	0.01%	0.01%	0.01%	0.00%
RBCS_SubCat - Office/Outpatient Services	10.36%	10.69%	10.10%	10.66%	10.62%	9.65%	9.68%	9.09%	9.25%	9.33%	9.83%	9.75%	9.48%	9.15%	9.12%	8.72%	9.85%	8.95%
RBCS_SubCat - Ophthalmological Services	0.82%	0.77%	0.81%	0.90%	0.64%	0.68%	0.70%	0.63%	0.60%	0.78%	0.78%	0.74%	0.62%	0.72%	0.66%	0.72%	0.63%	0.63%
RBCS_SubCat - Orthotic Devices	0.63%	0.49%	0.69%	0.47%	0.63%	0.58%	1.38%	1.36%	1.56%	2.41%	3.05%	3.85%	5.9%	4.38%	4.85%	3.30%	2.87%	1.90%
RBCS_SubCat - Other DME	2.17%	1.82%	1.64%	1.74%	1.87%	1.86%	1.37%	1.40%	0.99%	1.38%	1.37%	1.50%	1.78%	1.26%	1.29%	1.09%	1.29%	1.28%
RBCS_SubCat - Other Organ Systems	1.60%	2.70%	2.14%	2.19%	2.41%	1.93%	2.67%	2.44%	2.39%	2.45%	2.55%	2.86%	1.88%	2.95%	2.69%	2.35%	2.36%	2.73%
RBCS_SubCat - Oxygen and Supplies	0.22%	0.20%	0.20%	0.22%	0.20%	0.20%	0.21%	0.23%	0.18%	0.21%	0.20%	0.22%	0.24%	0.19%	0.22%	0.19%	0.21%	0.22%
RBCS_SubCat - Physical, Occupational, and Speech Therapy	2.93%	2.83%	2.67%	2.88%	2.77%	2.51%	2.56%	2.78%	2.92%	3.08%	3.34%	3.47%	3.37%	3.25%	3.15%	2.87%	2.96%	2.96%
RBCS_SubCat - Pulmonary	0.08%	0.07%	0.04%	0.08%	0.09%	0.06%	0.09%	0.09%	0.08%	0.09%	0.11%	0.10%	0.08%	0.09%	0.07%	0.07%	0.07%	0.08%
RBCS_SubCat - Radiation Oncology	0.42%	0.32%	0.84%	0.16%	1.14%	0.57%	0.23%	0.17%	0.28%	0.37%	0.90%	0.86%	1.04%	0.69%	0.66%	0.53%	0.47%	0.42%
RBCS_SubCat - Skin	1.93%	1.94%	1.85%	1.90%	1.82%	1.61%	1.71%	1.60%	1.51%	1.77%	1.65%	1.78%	1.71%	1.80%	1.59%	1.71%	1.57%	1.57%
RBCS_SubCat - Spinal Manipulation	0.39%	0.40%	0.37%	0.38%	0.39%	0.34%	0.38%	0.34%	0.32%	0.34%	0.39%	0.44%	0.42%	0.36%	0.36%	0.35%	0.36%	0.34%
RBCS_SubCat - Standard X-ray	1.30%	1.39%	1.39%	1.35%	1.44%	1.20%	1.24%	1.13%	1.22%	1.10%	1.27%	1.27%	1.39%	1.09%	1.20%	1.18%	1.24%	1.14%
RBCS_SubCat - Test - Miscellaneous	0.06%	0.08%	0.04%	0.07%	0.06%	0.05%	0.06%	0.05%	0.06%	0.05%	0.07%	0.06%	0.07%	0.04%	0.07%	0.03%	0.07%	0.05%
RBCS_SubCat - Treatment - Miscellaneous	0.50%	0.62%	0.50%	0.24%	0.28%	0.22%	0.19%	0.20%	0.29%	0.26%	0.31%	0.36%	0.24%	0.25%	0.25%	0.19%	0.27%	0.16%
RBCS_SubCat - Ultrasound	1.13%	1.18%	1.11%	1.06%	0.95%	0.91%	1.03%	0.96%	0.86%	0.91%	1.01%	1.00%	1.05%	1.10%	0.92%	0.91%	0.95%	0.92%
RBCS_SubCat - Vascular	0.84%	1.22%	1.16%	0.74%	0.45%	0.56%	0.62%	0.55%	0.94%	1.32%	0.52%	0.83%	0.42%	1.31%	0.30%	1.01%	0.93%	0.50%
RBCS_SubCat - Vision, Hearing, and Speech Services	0.13%	0.23%	0.20%	0.20%	0.20%	0.10%	0.30%	0.18%	0.17%	0.25%	0.18%	0.12%	0.11%	0.09%	0.12%	0.15%	0.12%	0.10%
RBCS_SubCat - Wheelchairs	0.05%	0.38%	0.22%	0.59%	0.32%	0.38%	0.36%	0.11%	0.08%	0.08%	0.05%	0.04%	0.03%	1.00%	0.06%	0.37%	0.04%	0.24%



Control Charts, Normal Distribution & 3 St Dev from the Mean

I used the concept of control charts, and only surfacing those HCPCS Codes that were > 3 St Dev over the 12 Month rolling Average.



I should have used LN(Dollars) to counter Skewness



HCPCS Codes 3 St Dev over Average

Obviously we excluded Covid Vaccines and Tests, and Influenza Vaccines

In 2023 , this process found 9 HCPCS / Months triggers including 3 for the 2 SAHS HCPCS Codes .

In 2024 , there has been 3 HCPCS / Months triggers for 2 unique HCPCS .

In total for 2023/24 there was over 165,000 unique HCPCS / Months

This process will flag the first big change, we need to filter the output and track those HCPCS codes subsequently.

(Among the codes we found were some low volume coronary, pulmonary and upper respiratory tract procedures.)



Algorithm

From 1/1/19

Line-Item Code
First of the Month of Claim Line From Date
Allowed Amount
Current Claim Unique Identifier / Line Item Number
Category Description
Subcategory Description
Family Description

} Restructured BETOS
Classification System

Diagnosis Related Group Code
First of the Month of Claim From Date
Claim Payment Amount
Current Claim Unique Identifier / Line Item Number
DRG Type
Claim Bill Facility Type Code
'Inpatient'

From
Part B Physicians &
Part B DME &
Part A Revenue Center Detail

Where
HCPCS Code exists
Allowed > 0

From
Part A Claims Header File

Where
DRG \neq '0000'
Claim Payment Amount > 0

Create a List (A)
of Every Month
for
Every Code
(HCPCS and DRG)

(B)



Exclude from Trigger if

- Standard Deviation of Count is ≤ 0.1
- Count < 2 per Month
- Average Count < 2
- Sum < \$1500 per Month

For each Month / Code
Calculate Count and Sum
Threshold of
3 x Standard Deviations
+ Average
As Trigger

For each rolling 12 Month period
Calculate
Average Count of Codes
Standard Deviation of Count of Codes
Average Sum of Dollars
Standard Deviation of Sum of Dollars

On (A)
Join (B) and calculate
Count of Codes
Sum of Dollars
For each Month
For each Code /
Category



Questions ?

