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Understanding and Impacting Care Variations Across a Multihospital System

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Learning Objectives

- Explain a standard approach to data, insights and improvement across several acute care hospitals.
- Describe strategies for reducing variation, specifically surrounding costs associated with labs, imaging and drugs.

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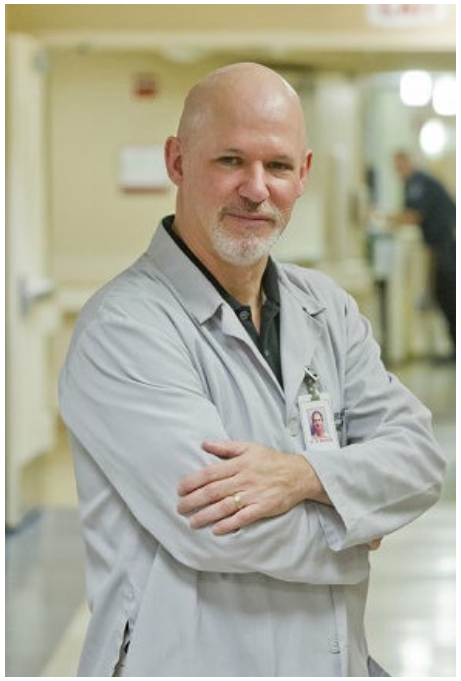
Introductions

Liz Thorn
System AVP Acute Care Quality &
Clinical Data Management



Bruce McNulty
CMO, Swedish Hospital

Alya Ahsan
Associate Division Chief,
Hospital Medicine NorthShore
and Swedish Hospitals

2020 – 2025 Forming Endeavor Health

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2020

Swedish Hospital joins NorthShore

2021

Northwest Community Healthcare Joins

2022

NorthShore and **Edward-Elmhurst Health** merge

2023

Rebrand as **Endeavor Health**

2024

System alignment across **Endeavor Health** begins

2025

And beyond

System Alignment advances

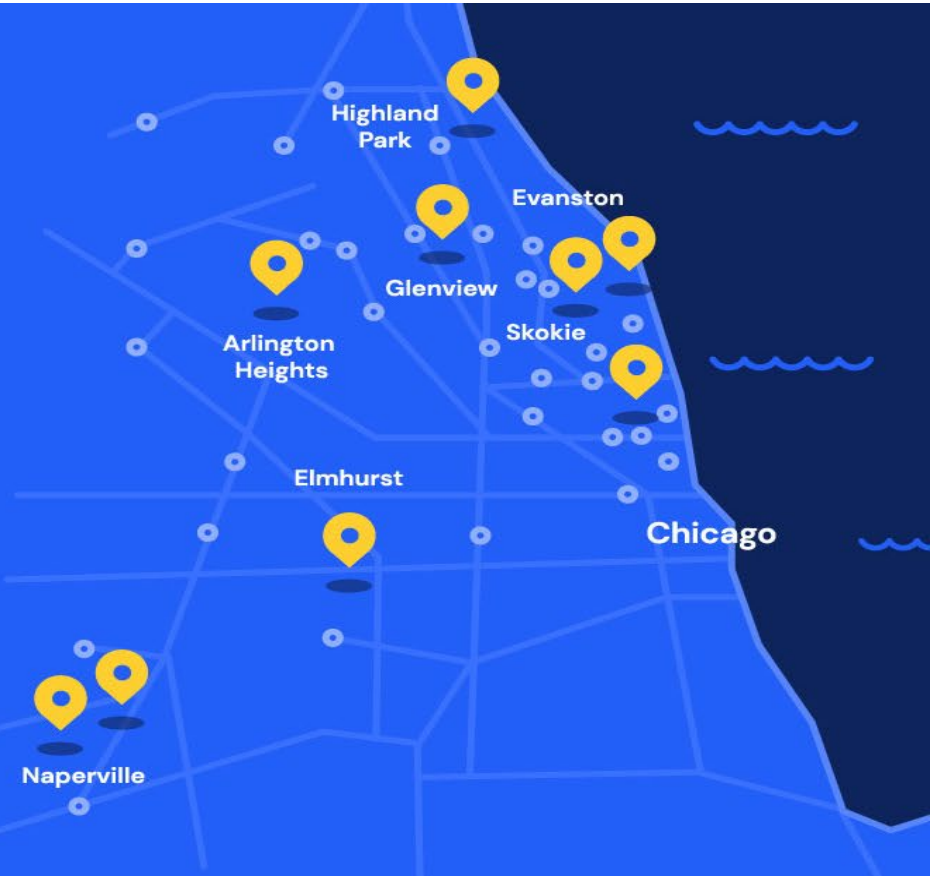
Our Service Area Encompasses One-Third of Illinois' Population

Service Area Population

4.2M

(one-third of Illinois' population)

- **300+** Sites of care across **100+** ambulatory locations
- **9** Hospitals
- Serving **~1.38 million** patients



Nine Hospitals, One Integrated System

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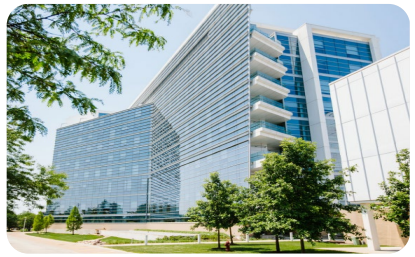
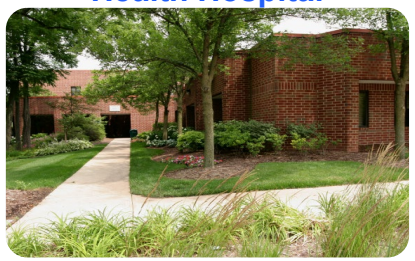
	Endeavor Health Northwest Community Hospital	Endeavor Health Evanston Hospital	Endeavor Health Edward Hospital	Endeavor Health Swedish Hospital	Endeavor Health Elmhurst Hospital
					
Beds	509	372	359	289	258

	Endeavor Health Glenbrook Hospital	Endeavor Health Highland Park Hospital	Endeavor Health Skokie Hospital	Endeavor Health Linden Oaks Behavioral Health Hospital
				
Beds	173	139	123	108

2,330

Total Licensed Beds

System Evolution and Context

Research shows that as health systems come together, quality and experience generally stay the same or worsen. Our organizational goal has been to reverse that trend and ensure consistent care delivery and exceptional outcomes across all of our hospitals.

Clinical Review & Education

JAMA | Special Communication

Organization and Performance of US Health Systems

Nancy D. Beaulieu, PhD; Michael E. Chernew, PhD; J. Michael McWilliams, MD, PhD; Mary Beth Landrum, PhD; Maurice Dalton, MA; Angela Yutong Gu, MA; Michael Briskin, BA; Rachel Wu, BA; Zakaria El Amrani El Idrissi, BA; Helene Machado, BS; Andrew L. Hicks, MA; David M. Cutler, PhD

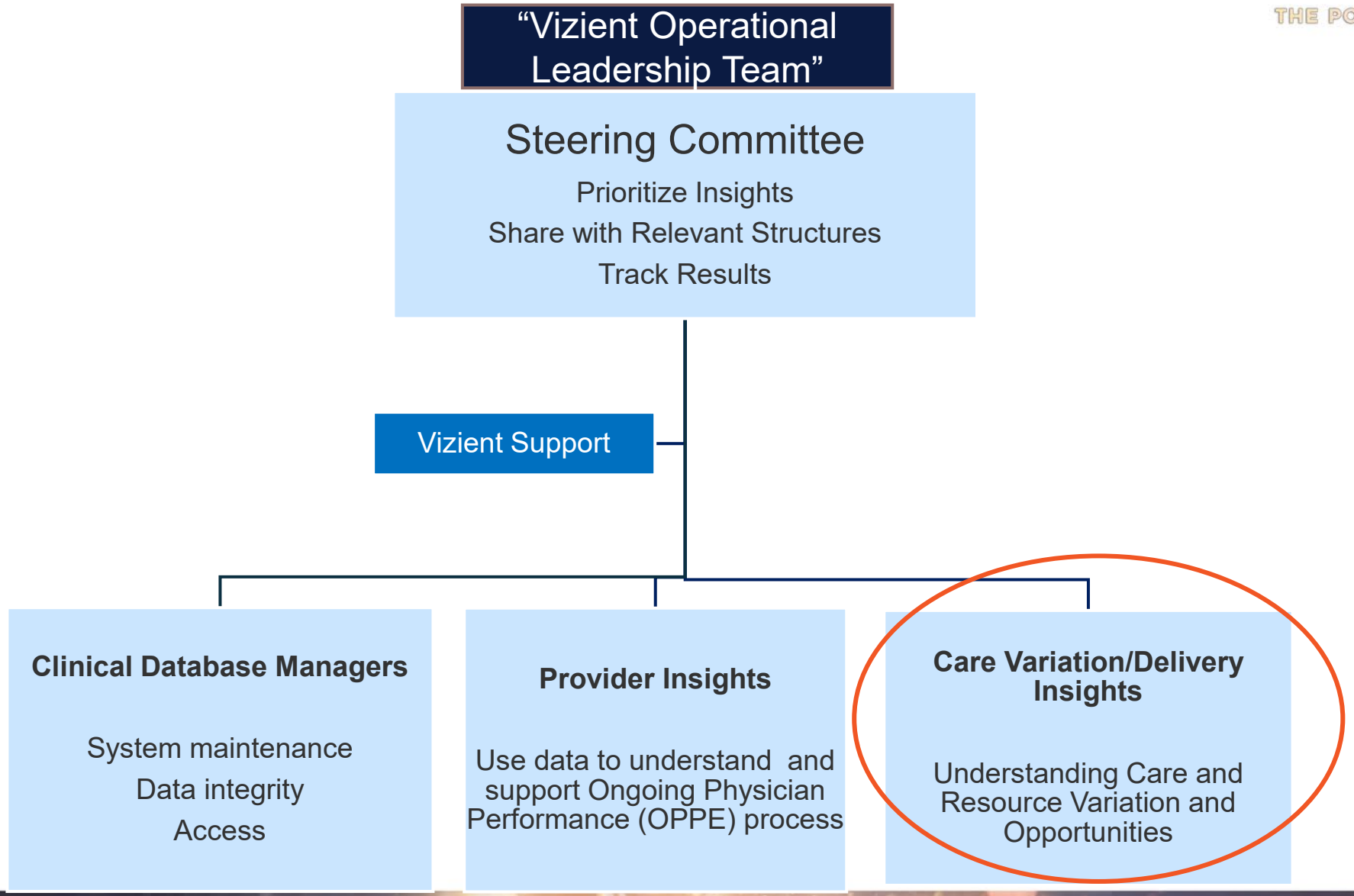
CONCLUSIONS AND RELEVANCE In 2018, health system physicians and hospitals delivered a large portion of medical services. Performance on clinical quality and patient experience measures was marginally better in systems but spending and prices were substantially higher. This was especially true for small practices. Small quality differentials combined with large price differentials suggests that health systems have not, on average, realized their potential for better care at equal or lower cost.

Source: Beaulieu ND, Chernew ME, McWilliams JM, et al. Organization and Performance of US Health Systems. JAMA. 2023;329(4):325 https://jamanetwork.com/journals/jama/article-abstract/2800656. 10.1001/jama.2022.24032.

Data Across the System – 2023 Snapshot

- Scorecards
- Improvement opportunities
- Public reporting capabilities
- Not standard or proactive enough
  - How do we develop a common understanding of data and a forum for review and prioritization?

Data and Governance Structure



2023 Journey – Care Variations

- Representation across the system, including 5 CMOs, physician leaders (infection control, hospital medicine, others), CDI, quality, analytics, and leaders in Pharmacy, Lab, Imaging

- Began by level setting –how do we accelerate our consistency journey, what should our process be?

3 Key Areas for Stewardship

MRI Utilization
Cardiac & Spine MRI

Laboratory
Procalcitonin testing
C. diff testing
Routine Labs

Medications
Remdesivir
Bleeding reversal agents

Care Variations Process

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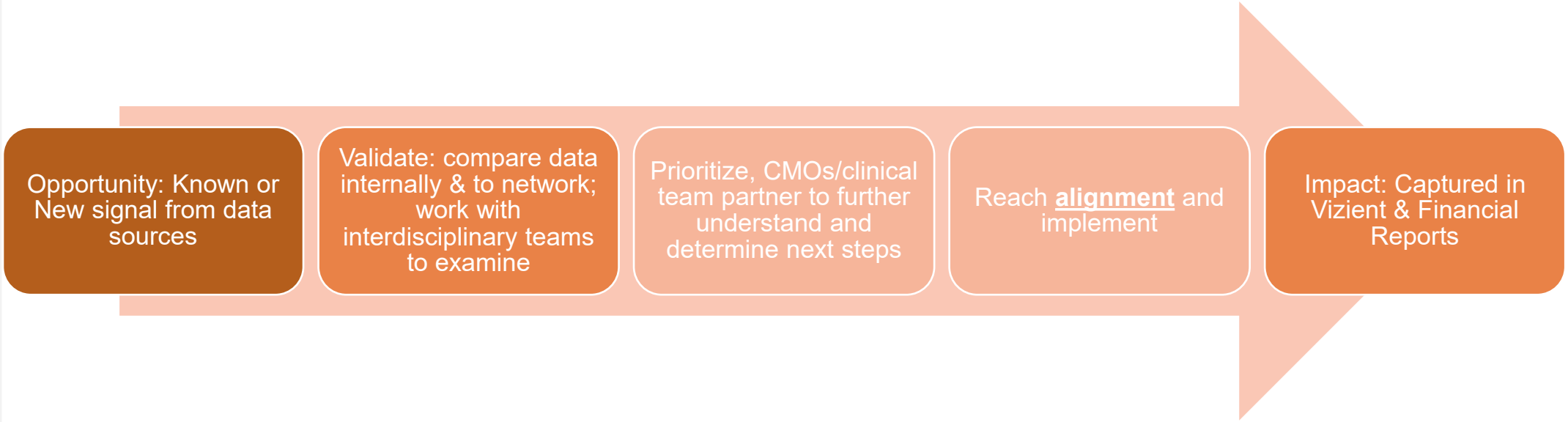
ALIGN

- **A:** Alerted to variation, exploration has been initiated
- **L:** Leveraging data and clinical review to validate alert
- **I:** Insight validated, improvement design has initiated
- **G:** Gaining consensus on standardization
- **N:** New standard deployed and is being monitored



Data In, Data Out

Combined view across system and resource allows for easy comparison internally and to cohort. Heat map for highest variation.

Top Overutilized Lab Resources Across System Q2 2022 - Q1 2023

Inpatients ≥ 18 Years of Age

Units to Reduce: Sum of Resource Units to Reduce to reach median usage rate for hospitals specific Vizient cohort
RI Variance: Sum of Positive Variance in Resource Intensity per total cases to the median. If value displays 0, the true value is negative but removed as to only display opportunities
%tile: Percentile Rank of resource intensity per total cases among hospitals specific Vizient cohort

Vizient Clinical Data Base. Irving, TX: Vizient, Inc.; 2023. https://www.vizientinc.com. Accessed July 2023.

	ED			ELM			EV			GB			HP			NCH			SK			SWE		
Lab Resource	Units to Reduce	RI Variance	%tile	Units to Reduce	RI Variance	%tile	Units to Reduce	RI Variance	%tile	Units to Reduce	RI Variance	%tile	Units to Reduce	RI Variance	%tile	Units to Reduce	RI Variance	%tile	Units to Reduce	RI Variance	%tile	Units to Reduce	RI Variance	%tile
87636 - sarscov2 & inf a&b amp prb							11404	19005	96	6750	11249	99	5572	9286	91	19879	33129	100	1604	2673	95	10103	16836	100
87150 - identification of organisms by genetic analysis	5403	2215	66	4461	1829	69	12124	4971	77	12342	5060	88	6116	2508	78				194	80	68	23634	9690	100
88307 - pathology examination of tissue using a microscope	1108	4197	87	1821	6897	96	2275	8617	98	-233	0	19	209	790	73	1021	3868	82	-145	0	4	248	939	70
88184 - flow cytometry technique for dna or cell analysis	-61	0	28	-30	0	34	-16	0	42	22	84	72	-8	0	43	3556	13465	100				-43	0	14
U0002 - 2019-ncov coronavirus, sars-cov-2/2019-ncov (covid	13374	8380	100	6742	4224	91																		
82948 - blood glucose (sugar) measurement using reagent st							105976	6242	70	35305	2079	94	8708	513	58				860	51	53	37441	2205	85
80048 - blood test, basic group of blood chemicals	-20385	0	16	8660	856	72	24764	2447	90	30385	3002	100	16126	1593	97	-11944	0	29	4440	439	90	4273	422	68
88309 - pathology examination of tissue using a microscope	114	1035	77	221	2001	95	214	1944	92	27	245	77	9	82	61	191	1736	85	-17	0	1	-50	0	7
85027 - complete blood cell count (red cells, white blood	-13903	0	24	-3718	0	40	29724	2247	92	21970	1661	99	18933	1431	99	11521	871	68	4680	354	89	3502	265	68
81455 - test for detecting genes associated with cancer	5	162	62	-4	0	32	149	5084	100	20	681	94	21	711	98				-1	0	38	2	64	59
87493 - detection test for clostridium difficile	1263	550	97	1713	746	97	3983	1735	100	3691	1607	100	2326	1013	99	253	110	69	216	94	97	1760	766	99
87641 - detection test for staphylococcus aureus, methicil	-1331	0	19	618	253	67	3451	1415	97	4139	1697	100	2476	1015	99	1065	437	72	442	181	94	1406	577	88
84145 - procalcitonin (hormone) level	-961	0	42	-2062	0	23	-2911	0	15	-635	0	37	-1377	0	12	2364	752	72	-550	0	7	9965	3169	99
88341 - special stained specimen slides to examine tissue	1597	1625	85	549	558	67	905	921	76	308	314	76	-23	0	46	-515	0	36	-189	0	10	-403	0	19
80307 - testing for presence of drug	-1756	0	21	-1781	0	9	2459	1785	88	110	80	55	357	259	67	-930	0	31	-268	0	15	342	249	63
88331 - pathology examination of tissue during surgery	50	92	65	203	374	89	729	1340	94	-13	0	6	-27	0	14	526	966	91	35	65	76	-2	0	48
87149 - identification of organisms by genetic analysis																10963	2569	88						
87507 - detection test for digestive tract pathogen	384	1872	81	128	623	69																		
80076 - liver function blood test panel	-1076	0	31	3332	318	79	9647	921	90	7378	705	98	4336	414	93	-163	0	46	111	11	62	461	44	64
84100 - phosphate level	-11335	0	11	-4467	0	29	13264	735	74	12062	668	93	4124	228	78	-8245	0	20	-109	0	47	12175	674	91
82803 - blood gases measurement	-1600	0	46	-5716	0	17	1807	550	61	2089	636	80	572	174	57	-9654	0	14	-413	0	33	2822	860	78
88305 - pathology examination of tissue using a microscope	856	501	77	1080	632	89	571	335	74	117	69	60	91	53	64	545	319	68	-199	0	14	-310	0	20
87633 - detection test for multiple types of respiratory v																340	1657	65						
87632 - detection test for multiple types of respiratory v																643	1638	81						
80320 - alcohols levels	-40	0	12	-791	0	0										1639	1497	73						
85097 - bone marrow, smear interpretation	6	50	58	-2	0	47	89	810	95	36	329	98	29	259	93	1	6	53				-6	0	24
88381 - preparation of specimen, manual	182	433	98	39	93	81	236	563	100	83	197	100	45	108	96				-1	0	34	1	2	53
80100 - drug screen qualitate/multi							47	21	67	1446	659	100	1517	692	100				-261	0	13	-426	0	0
84132 - blood potassium level	13098	728	86	11110	618	95	-1464	0	38	456	25	67	-550	0	34	-3426	0	25	-38	0	47	-1857	0	2

Care Variations Efforts

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Inpatients 18 and above
Time Frame: Q2 2022-Q1 2023

Hospital	Individual resource description	Your percentile
ED	procalcitonin (hormone) level	42
ELM	procalcitonin (hormone) level	23
EV	procalcitonin (hormone) level	15
GB	procalcitonin (hormone) level	37
HP	procalcitonin (hormone) level	12
NCH	procalcitonin (hormone) level	72
SK	procalcitonin (hormone) level	7
SW	procalcitonin (hormone) level	99

Variation across sites within the system & variation across like compare group

Procalcitonin in Sepsis population

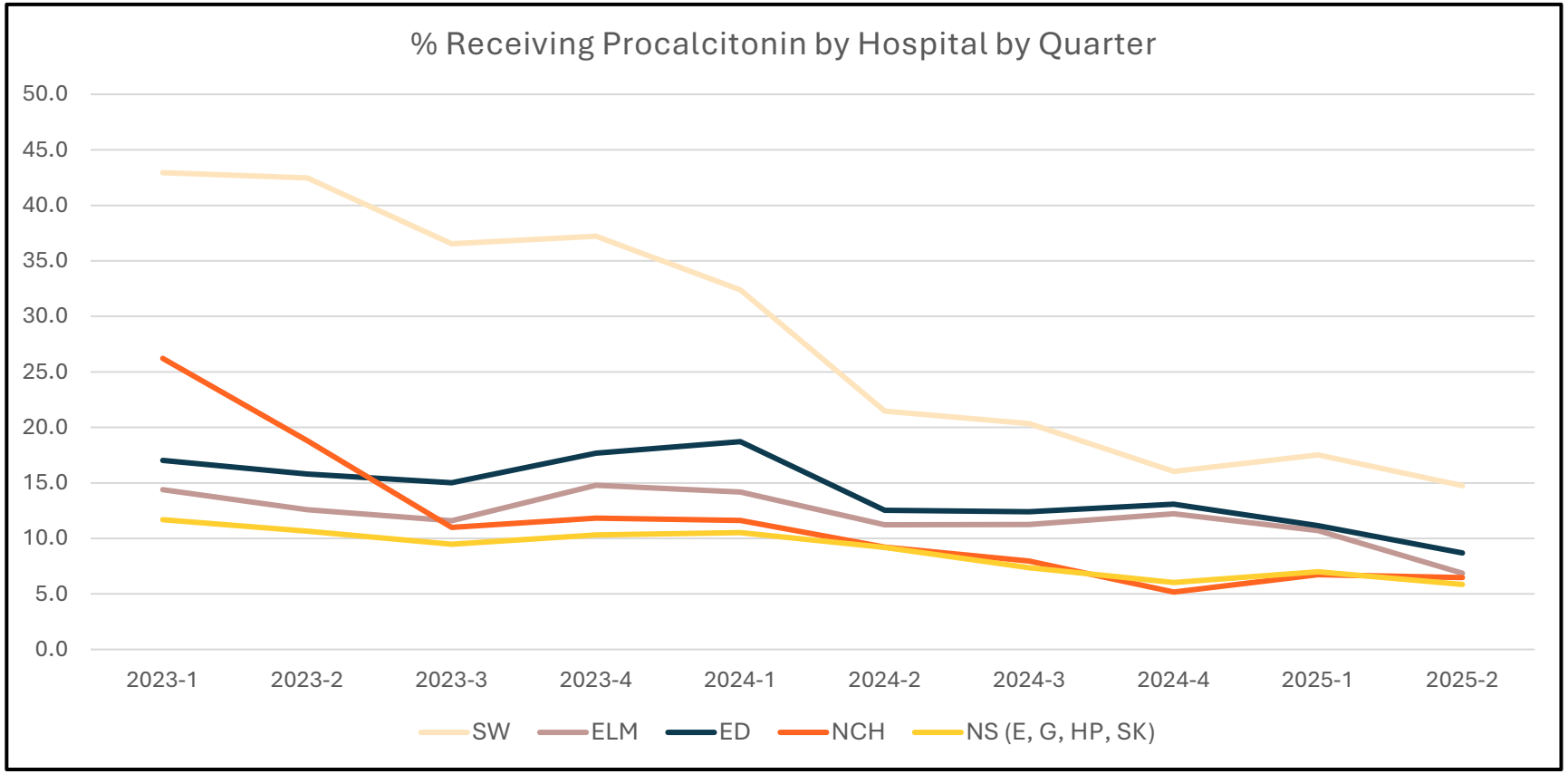
CY2022

		With Procalcitonin					Without Procalcitonin				
Hospital/ Hospital System	Sepsis DRG Cases	Cases	LOS Index	Mortality Index	Pct 30 Day Readmit*	Antibiotic Drug Days / Case	Cases	LOS Index	Mortality Index	Pct 30 Day Readmit*	Antibiotic Drug Days / Case
140114 SWEDISHHOSPITAL	843	822	0.83	1.15	14.68	10.6	21	0.66	0.00	16.67	4.7
140200 EE_ELMHURSTMEMORIAL	828	361	0.84	0.77	12.31	12.0	467	0.80	0.86	14.66	10.4
140231 EE_EDWARDHOSPITAL	976	546	0.87	0.79	18.63	9.9	430	0.73	0.76	12.31	7.8
140252 NORTHWESTCOMMUNITY	1,384	1,050	0.93	0.72	12.20	8.8	334	0.77	0.99	14.10	7.3
149610 NORTHSHORE_HIGHLANDPARK	469	135	1.02	1.19	16.07	12.2	334	0.89	0.76	12.87	9.4
149810 NORTHSHORE_GLENVIEW	996	340	1.05	0.72	11.82	10.6	656	0.82	0.94	11.78	7.8
149910 NORTHSHORE_EVANSTON_HOSP	865	212	0.92	0.76	10.99	9.7	653	0.77	0.70	12.50	8.1
NORTHSHORE_SYSTEM	6,367	3,466	0.90	0.87	13.82	10.1	2,901	0.80	0.83	12.90	8.4

Across system: Decreased LOS O:E, Mortality O:E, and Readmissions without use of procalcitonin.
Nearly 2 days greater antibiotic use with procalcitonin.

Vizient Clinical Data Base. Irving, TX: Vizient, Inc.; 2023. https://www.vizientinc.com. Accessed July 2023.

Procalcitonin Testing Initiatives



2023: Education, monitoring, additional education ($240,000+)

2024: Restrictions on utilization to certain user types ($122,000+)

Cardiac MRI

Inpatient Resource Intensity by Imaging Individual Resource (Patients ≥ 18 Years of Age and Older)

Time Period: Quarter 3 2022, Quarter 2 2022, Quarter 1 2022, Quarter 4 2021

High Utilization Compared to Peers

	Subminor class	Individual resource code	Individual resource description	% Cases receiving resource	Your percentile
Evanston	mri - heart	75559	mri of heart with stress imaging	0%	75
	mri - heart	75561	mri of heart before and after contrast	1%	96
	mri - heart	75563	mri of heart before and after contrast with stress	0%	81
	mri - heart	75565	mri of blood flow of heart	1%	99
Glenbrook	mri - heart	75557	mri of heart	0%	26
	mri - heart	75561	mri of heart before and after contrast	0%	36
	mri - heart	75565	mri of blood flow of heart	0%	66
Highland Park	mri - heart	75561	mri of heart before and after contrast	0%	62
	mri - heart	75565	mri of blood flow of heart	0%	86
Northwest Community	mri - heart	75557	mri of heart	0%	6
	mri - heart	75561	mri of heart before and after contrast	0%	40
Swedish	mri - heart	75557	mri of heart	0%	19
	mri - heart	75561	mri of heart before and after contrast	0%	14
	mri - heart	75565	mri of blood flow of heart	0%	35
Edward	mri - heart	75561	mri of heart before and after contrast	0%	25
	mri - heart	75557	mri of heart	0%	7

NOTE: No cardiac MRIs at SK. Elmhurst data not available at this time

Concurrent delays in inpatient MRI availability for other types as well as decreased outpatient access

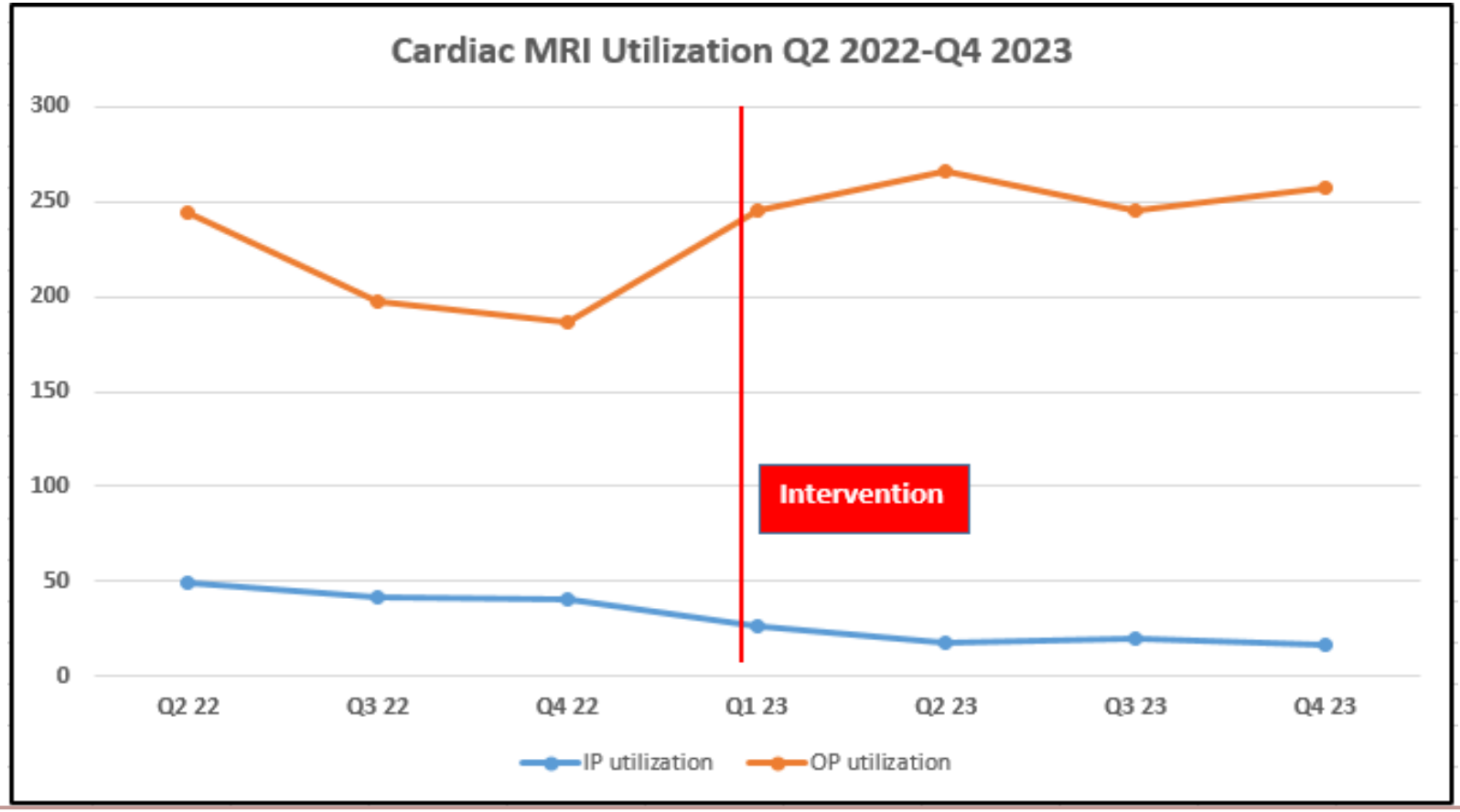
Vizient Clinical Data Base. Irving, TX: Vizient, Inc.; 2023. https://www.vizientinc.com. Accessed March 2023.

Inpatient Cardiac MRI Criteria

In an effort to better steward our limited acute care resources, we will restrict INPATIENT cardiac MRI beginning 4/3/23 to patients who meet the following clinical criteria:

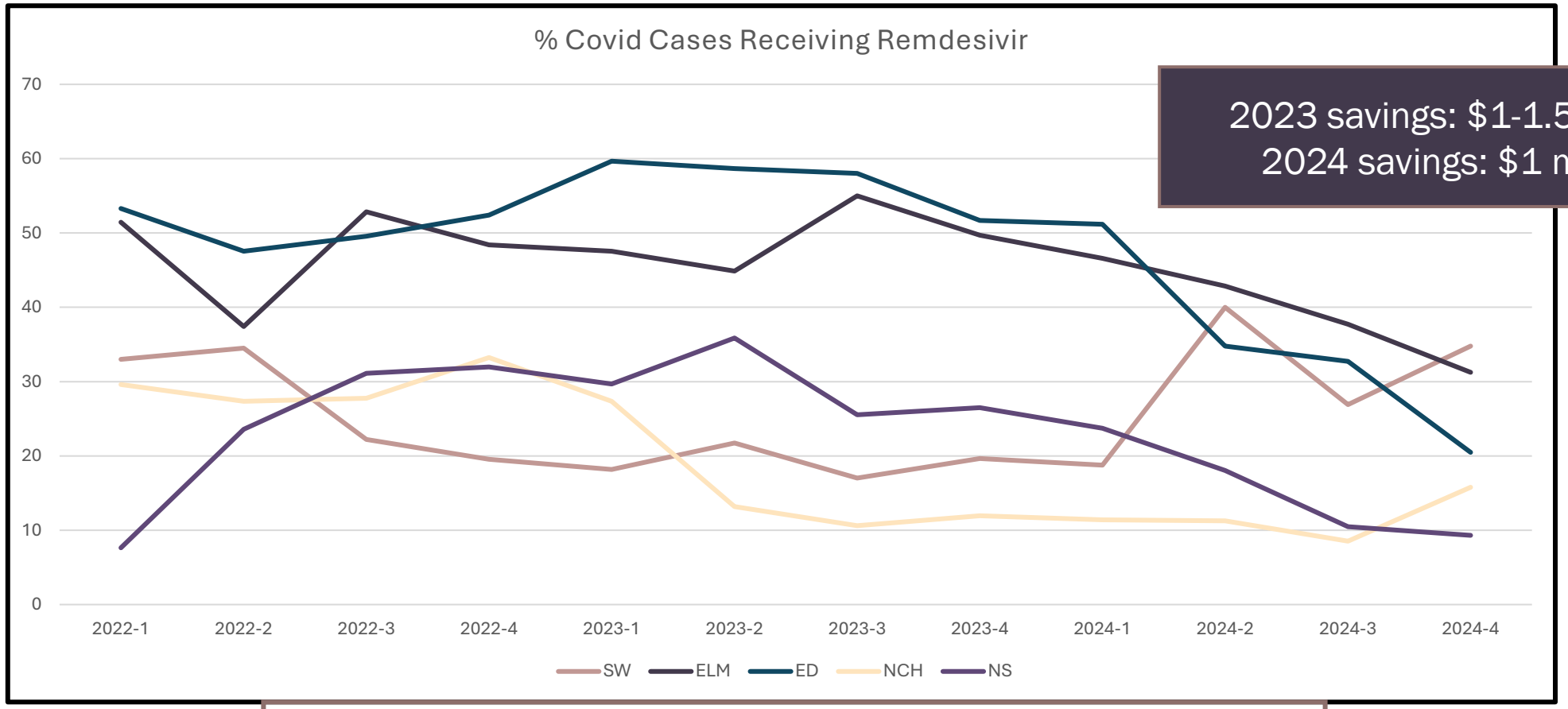
- Evaluation for infiltrative cardiomyopathy in the setting of complete heart block or VT;
- Evaluation of acute myocarditis; or
- Viability evaluation prior to planned urgent revascularization.

Cardiac MRI Utilization



Change in frequency of inpatient cardiac MRIs and outpatient cardiac MRIs following intervention. There was a significant decrease in inpatient cMRI and an increase in outpatient cMRI, creating a positive financial impact of $340,000.

Remdesivir Utilization



2023 savings: $1-1.5 million
2024 savings: $1 million

Standard use criteria developed and deployed at 1 hospital, subsequently achieved system alignment across all hospitals and continued to refine patient eligibility.

Lessons Learned

- You can’t change clinician behavior without engaging clinicians. It’s important to understand perspectives across hospitals, areas, etc. while also being clear that consistent outcomes and value have to be achieved.
- Don’t let the data fool you – not all variation is unacceptable, real, or worth pursuing.
- Once a structure and approach are in place, can be done efficiently and without exhaustive resources.

Key Takeaways

Preparation is Key

Validate data (as many times as it takes)
Thoroughly understand issue and have a clear ask

Engage physician champions early and often

Context is Critical

What is everyone else being asked to do? (system)

What is everyone else doing better/differently than we are? (outside hospitals)

Select the vital few and be disciplined

Data is a blessing but can turn into a curse

2023: Explored ~15-20 opportunities ($1.9 million)
2024: Focused on ~5 ($3.5 million)
2025: Redesign to include additional data sources and expand efforts

Questions?

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