Northwell Health — Healthcare Financial Relationships Analysis
Comprehensive Conflict of Interest Investigation Report

Conflixis Data Analytics Division

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Abstract

This investigative report analyzes pharmaceutical industry financial relationships with healthcare providers at Northwell Health, examining $114.7 million in payments to 11,102 providers from 2020-2024. The analysis identifies patterns of influence, risk concentrations, and provides actionable compliance recommendations.

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1.1 Executive Summary

2 Executive Summary: The Scale and Impact of Pharmaceutical Financial Relationships

A comprehensive analysis of healthcare financial relationships reveals a systematic network of pharmaceutical industry payments reaching 11,178 healthcare providers who received $114,735,791 across 585,855 transactions between 2020 and 2024. This represents approximately 73% of providers in the analyzed network, demonstrating the pervasive nature of industry financial engagement across the healthcare system.

2.1   Quantified Correlation Patterns

The data reveals substantial correlations between payment receipt and prescribing behavior. Providers receiving pharmaceutical payments prescribe medications at dramatically higher rates than their non-payment counterparts. NURTEC ODT demonstrates the most pronounced pattern, with paid prescribers averaging $8,606,169 in prescription value compared to $15,870 for non-recipients—a 542-fold difference. This pattern extends across multiple therapeutic categories, with diabetes medications showing influence factors ranging from 89x to 148x baseline prescribing rates.

2.2   Provider Vulnerability Patterns

Analysis reveals differential susceptibility across provider types. While physicians show the highest absolute influence factor at 190x, representing dramatic differences in prescribing costs with and without payments, mid-level practitioners demonstrate significant responsiveness. Physician assistants exhibit a 51.5x influence factor, with nurse practitioners showing 45x, indicating substantial behavioral changes despite lower baseline prescribing volumes.

2.3   Sustained Relationship Effects

Providers maintaining consecutive-year payment relationships demonstrate compounding prescribing changes. Five-year recipients generate prescription values of $147 million compared to single-year recipients' $564,037—a 260-fold increase that suggests normalized behavioral modifications through sustained financial engagement.

2.4   Critical Risk Concentration

The analysis identifies 326 high-risk providers (2.11% of total) with combined payment and prescription patterns requiring immediate regulatory attention, while 1,408 medium-risk providers warrant enhanced monitoring protocols.

2.5   1. The Landscape of Industry Financial Relationships

3   The Landscape of Industry Financial Relationships

The scope of pharmaceutical and medical device industry financial relationships with healthcare providers reveals a comprehensive engagement strategy spanning 11,178 unique providers who received $114,735,790.91 across 585,855 transactions between 2020 and 2024. This level of penetration across the healthcare system demonstrates the systematic nature of industry-provider financial relationships.

3.1   Temporal Evolution of Financial Engagement

The data reveals a clear trajectory of expanding industry engagement with healthcare providers over the five-year period:

Year	Providers	Total Payments	Average Payment	Transaction Count
2020	4,703	$17,835,248	$744.69	74,806
2021	6,445	$19,217,487	$591.49	113,637
2022	7,060	$25,575,768	$700.51	128,776
2023	7,431	$28,098,128	$738.78	133,382
2024	7,539	$24,009,159	$613.62	135,254

The progression shows a 60% increase in provider participation from 2020 to 2024, with total payments peaking at $28.1 million in 2023. The 2024 decline to $24 million suggests potential regulatory or market adjustments, though transaction volume continued to grow, reaching 135,254 individual payments.

3.2 Strategic Payment Categories

The distribution of payment categories reveals distinct engagement strategies, with high-value consulting and speaking arrangements complementing broad-based relationship building:

Payment Category	Total Amount	Transaction Count	Average Amount
Speaking/Faculty Services	$33,299,959	14,967	$11,299.61
Royalty or License	$25,269,489	734	$128,271.52
Consulting Fee	$22,622,976	8,334	$6,737.04
Food and Beverage	$16,610,375	533,086	$108.32

The data shows a dual approach: high-value relationships through consulting fees and speaking engagements targeting 953 and 713 providers respectively, while food and beverage payments create touchpoints with 10,827 providers through 533,086 transactions averaging $108 each.

3.3 Market Leadership and Provider Reach

The concentration of payments among leading manufacturers demonstrates strategic market positioning:

Manufacturer	Total Payments	Providers Reached	Avg per Provider	Market Share
Zimmer Biomet Holdings	$10,932,486	303	$36,080.81	9.53%
Arthrex, Inc.	$6,153,610	127	$48,453.62	5.36%
Medtronic, Inc.	$3,853,254	1,752	$2,199.35	3.36%
ABBVIE INC.	$3,284,973	2,405	$1,365.89	2.86%
Allergan, Inc.	$3,004,958	1,084	$2,772.10	2.62%

Zimmer Biomet's strategy of concentrated high-value relationships contrasts with Medtronic's broader engagement model reaching 1,752 providers. ABBVIE's approach of reaching 2,405 providers with smaller average payments suggests a volume-based relationship strategy, while Arthrex maintains the highest average payment per provider at $48,453.62.

This landscape reveals a mature ecosystem of financial relationships where industry systematically engages healthcare providers through multiple payment mechanisms, creating a network of financial connections that spans thousands of practitioners across diverse medical specialties.

3.4   2. Prescription Patterns

4   Prescription Patterns Across the Healthcare System

Analysis of prescription data reveals distinct patterns in medication prescribing that reflect both clinical needs and cost considerations across different provider types and specialties.

4.1   High-Value Medication Concentration

The prescription landscape shows significant concentration in high-cost medications, with the top 10 drugs accounting for substantial healthcare expenditure:

Drug Name	Total Cost (M)	Claims	AvgCost/Claim($)	Unique Prescribers
OZEMPIC	456.5	526,215	1,043	2,734
ELIQUIS	436.3	672,764	676	6,327
JARDIANCE	344.8	450,935	913	3,095
TRULICITY	324.9	319,687	1,133	2,018
JANUVIA	251.1	339,352	862	2,853
HUMIRA(CF) PEN	221.5	45,826	5,976	514
BIKTARVY	215.3	75,960	3,544	726
MOUNJARO	204.6	243,814	1,016	1,923
FARXIGA	189.9	257,546	894	2,796
XARELTO	189.1	303,131	746	4,458

These medications represent 23.8% of total prescription costs, with diabetes and cardiovascular drugs dominating the list. The data shows HUMIRA commanding the highest per-prescription cost at $5,976, while ELIQUIS demonstrates the broadest prescriber adoption with 6,327 unique providers.

4.2 Specialty-Driven Prescribing Patterns

Specialty analysis reveals significant variations in prescribing costs per claim. Oncology-Hematology/Oncology leads with an average cost of $1,455 per prescription, followed by Gastroenterology at $459 per prescription. In contrast, Family Practice maintains lower average costs at $133 per prescription, suggesting different therapeutic approaches and patient populations.

Endocrinology, despite having only 127 providers, generates $921 million in prescription costs, indicating intensive use of high-cost diabetes medications like those seen in the top drugs list.

4.3 Provider Type Prescribing Patterns

Provider Type	Total Prescriptions (M)	Total Cost (B)	$AvgCostperRx()$
Physician	89.4	9.9	111
Nurse Practitioner	3.9	0.7	181
Physician Assistant	4.3	0.4	103
Other	3.6	0.4	112

Physicians handle the majority of prescriptions (89.4 million) but maintain relatively moderate per-prescription costs. Nurse Practitioners show higher average costs per prescription at $181, potentially reflecting their role in managing complex chronic conditions requiring expensive medications.

These patterns suggest a healthcare system where specialty care drives high-cost prescribing, while primary care providers maintain cost-conscious prescribing practices across larger patient volumes.

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4.4 3. The Quantification of Influence

5 The Quantification of Influence: Extreme Correlations in Clinical Decision-Making

The relationship between pharmaceutical payments and prescribing patterns reveals correlations that challenge conventional understanding of clinical decision-making independence. Analysis of prescribing data across high-value medications demonstrates systematic variations in prescription volumes that correlate directly with payment receipt, with influence factors ranging from 60x to 542x baseline prescribing rates.

5.1 Documented Correlation Patterns

The data reveals profound correlations between payment receipt and prescribing behavior across multiple therapeutic categories. NURTEC ODT demonstrates the most substantial correlation, with prescribers receiving payments averaging $8,606,169 in prescription value compared to $15,870 for non-payment

recipients—representing a 542x influence factor. This pattern extends across diabetes medications, with FARXIGA showing a 148x factor and TRULICITY demonstrating a 114x correlation.

Drug Name	Prescribers w/ Payments	Avg Rx Value (Paid)	Prescribers w/o Payments	Avg Rx Value (No Pay)	Influence Factor	Total Rx Cost
NURTEC ODT	758	$8,606,169	144	$15,870	542.3x	$6,181,339,954
FARXIGA	2,289	$4,564,902	507	$30,821	148.1x	$10,121,363,581
XARELTO	3,443	$2,105,452	1,015	$14,959	140.7x	$6,807,069,331
ELIQUIS	4,657	$2,970,152	1,670	$24,481	121.3x	$13,204,972,550
TRULICITY	5,561	$10,976,296	457	$96,564	113.7x	$16,507,028,745
MOUNJARO	1,600	$7,727,813	323	$68,626	112.6x	$11,449,336,951

The systematic nature of these correlations extends beyond individual medications to encompass entire therapeutic categories. Anticoagulants ELIQUIS and XARELTO show influence factors of 121x and 141x respectively, while diabetes medications consistently demonstrate factors exceeding 80x across multiple drug classes.

5.2   Quantified Relationship Dynamics

These correlations represent a systematic redirection of clinical decision-making that correlates with financial relationships. The consistency of elevated prescribing among payment recipients across diverse therapeutic areas suggests patterns that cannot be explained by clinical factors alone. OZEMPIC prescribers receiving payments average $11,064,217 in prescription value versus $123,749 for non-recipients, creating an 89x differential in a medication with over $22.9 billion in total prescription costs.

The mathematical precision of these relationships indicates a quantifiable correlation between financial engagement and prescribing behavior. With influence factors consistently ranging from 60x to over 500x baseline rates, the data demonstrates correlations that extend far beyond random variation or clinical necessity patterns, suggesting systematic behavioral modifications that correlate directly with payment receipt across multiple pharmaceutical categories and prescriber populations.

5.3   4. The Hierarchy of Influence

5.4   The Hierarchy of Influence: Differential Susceptibility Across Provider Types

Analysis of payment influence patterns reveals significant variations across healthcare provider categories, with mid-level practitioners demonstrating distinct susceptibility profiles compared to physicians. The

data presents a complex landscape where traditional assumptions about prescribing independence may require reconsideration.

Provider Type	Total Providers	With Payments	Avg Rx (No Pay)	Avg Rx (With Pay)	Influence Factor
Physicians (MD)	10,042	7,344	$328,197	$62,499,448	190.4x
Physician Assistants (PA)	2,035	1,279	$83,612	$4,306,841	51.5x
Nurse Practitioners (NP)	1,441	907	$196,615	$8,842,997	45.0x

The influence factor analysis reveals a counterintuitive pattern. While physicians demonstrate the highest absolute influence factor at 190.4x, representing a dramatic difference between prescribing costs with and without industry payments, mid-level providers show substantial susceptibility despite lower baseline prescribing volumes.

Physician assistants, with 62.8% receiving industry payments, exhibit an influence factor of 51.5x, indicating that their prescribing costs increase by over 5,000% when receiving payments. Nurse practitioners show similar patterns with a 45.0x influence factor, despite 62.9% receiving payments. These ratios suggest that while mid-level providers may prescribe lower-cost medications in the absence of payments, their prescribing patterns demonstrate significant responsiveness to industry relationships.

The data reveals a concerning supervision gap. Mid-level providers, who typically operate under physician oversight in many practice settings, show influence factors that, while lower than physicians in absolute terms, represent substantial proportional changes in prescribing behavior. This pattern raises questions about the effectiveness of current oversight mechanisms in mitigating payment influence.

The "Unknown" category, though representing only 26 providers, shows the highest influence factor at 221.1x, suggesting that providers with unclear credentials may be particularly susceptible to payment influence. This finding underscores the importance of clear provider identification and appropriate oversight structures.

These patterns indicate that payment influence operates differently across provider types, with implications for regulatory oversight, supervision requirements, and professional education programs designed to address industry relationship management across the healthcare provider hierarchy.

5.5   5. The Psychology of Micro-Influence

5.6 The Psychology of Micro-Influence: Disproportionate Impact of Minimal Payments

The most significant finding in pharmaceutical payment analysis reveals an inverse relationship between payment size and return on investment. Providers receiving the smallest payments demonstrate the highest ROI ratios, suggesting that minimal financial relationships may produce disproportionate prescribing responses.

Payment Range	Provider Count	Avg Rx Value	ROI Factor	% of Total Providers
<$100	2,548	$418,809	9,999x	23.4%
$100-500	3,342	$622,676	2,568x	30.7%
$500-1K	1,282	$706,108	985x	11.8%
$1K-5K	2,399	$1,069,223	454x	22.0%
$5K-10K	613	$2,043,359	287x	5.6%
$10K+	918	$2,752,504	25x	8.4%

The data reveals that providers receiving payments under $100—averaging just $41.89 per provider—generate prescription costs averaging $418,809, creating an ROI factor of nearly 10,000x. This pattern suggests that behavioral economics principles, particularly reciprocity bias, may operate more effectively at minimal payment levels than substantial ones.

Providers in the smallest payment tier represent 23.4% of all payment recipients yet demonstrate the most dramatic cost-to-benefit ratios. The 3,342 providers receiving $100-500 payments show similarly elevated ROI factors of 2,568x, indicating that the micro-influence effect extends beyond the smallest payments.

This inverse correlation between payment size and ROI challenges assumptions about pharmaceutical influence mechanisms. While high-value payments to 918 providers ($10K+) generate substantial prescription volumes ($2.75 million average), their ROI factor drops to just 25x—still significant but dramatically lower than minimal payment tiers.

The concentration of providers in lower payment categories (54.1% receive under $500) combined with their exceptional ROI ratios suggests that pharmaceutical companies may achieve maximum prescribing influence through widespread distribution of minimal payments rather than concentrated high-value relationships. This pattern indicates that small financial gestures may trigger stronger reciprocal responses than substantial payments, which providers may view with greater scrutiny.

5.7 6. The Compounding Effect of Sustained Relationships

5.8 The Compounding Effect of Sustained Financial Relationships

The data reveals a clear pattern: healthcare providers who maintain financial relationships with pharmaceutical companies over multiple consecutive years demonstrate substantially different prescribing

behaviors compared to those with single-year interactions.

Analysis of consecutive payment years shows how sustained financial relationships create compounding effects on prescribing patterns:

Years of Payments	Provider Count	Avg Total Payments	Avg Total Rx Value	Multiplier vs Single Year
1 year	2,909	$28,160	$564,037	Baseline
2 years	1,962	$108,368	$2,449,632	22.6x
3 years	1,570	$230,842	$5,951,284	25.78x
4 years	1,670	$670,306	$15,346,010	22.89x
5 years	2,991	$11,402,491	$147,084,862	12.9x

The progression demonstrates how entrenched relationships develop over time. Providers receiving payments for just two consecutive years show prescription values 22.6 times higher than single-year recipients. This multiplier effect continues to escalate, with five-year recipients generating prescription values nearly 13 times higher than the four-year group, despite the lower multiplier ratio.

Particularly notable is the substantial increase in both payment amounts and prescribing values as relationships extend beyond three years. The jump from three-year to four-year relationships shows average payments nearly tripling from $230,842 to $670,306, while prescription values increase from approximately $6 million to over $15 million.

The 2,991 providers maintaining five-year consecutive relationships represent the most entrenched segment, with average total payments exceeding $11.4 million and generating prescription values of nearly $147 million. This sustained engagement pattern suggests that compound influence develops through repeated interactions, creating normalized expectations around prescribing behaviors that extend far beyond the immediate financial exchange.

These patterns indicate that the cumulative impact of sustained financial relationships may create more significant behavioral changes than isolated payment events.

5.9   7. Risk Assessment

6   Risk Assessment and Compliance Analysis

6.1   Risk Distribution Overview

The analysis of provider risk profiles reveals a concentrated pattern of elevated risk among a small subset of healthcare providers. The risk assessment framework identifies three distinct categories based on payment patterns and prescribing behaviors.

Risk Level	Provider Count	% of Total	Key Risk Indicators	Avg Risk Score
High Risk	326	2.11%	High payments + prescriptions	95.40
Medium Risk	1,408	9.10%	Moderate payments + prescriptions	84.20
Low Risk	13,747	88.80%	Low payments or prescriptions	36.50

6.2 Risk Concentration Patterns

The data demonstrates a clear risk stratification across the provider population of 15,481 healthcare professionals. High-risk providers represent 2.11% of the total population but exhibit significantly elevated risk scores averaging 95.40 points. This concentration suggests that compliance monitoring resources could be effectively focused on this limited subset.

Medium-risk providers constitute 9.10% of the population with an average risk score of 84.20, indicating moderate compliance concerns that warrant periodic review. The majority of providers (88.80%) fall into the low-risk category with an average score of 36.50, suggesting generally compliant behavior patterns.

6.3 Compliance Vulnerability Assessment

The risk indicators focus on the correlation between payment volumes and prescribing patterns. High-risk providers demonstrate both elevated payment receipts and prescription volumes, creating potential regulatory exposure under anti-kickback and Stark Law provisions. The substantial gap between high-risk scores (95.40) and low-risk scores (36.50) indicates clear differentiation in risk profiles.

6.4 Regulatory Exposure Considerations

The concentrated nature of high-risk activity among 326 providers suggests targeted compliance interventions could address the majority of potential regulatory concerns. The scoring methodology appears to effectively identify providers whose payment and prescribing patterns deviate significantly from standard practice norms.

Medium-risk providers may benefit from enhanced monitoring protocols, while the low-risk majority demonstrates compliance patterns consistent with regulatory expectations. This risk distribution supports a tiered approach to compliance oversight and resource allocation.

6.5 8. Recommendations

7 Actionable Recommendations for Healthcare Financial Oversight

7.1 Immediate Actions

Enhanced Monitoring Protocol: Implement immediate review of the 326 high-risk providers, prioritizing those with combined totals exceeding $50 million. Focus initial attention on the top 10 providers, including Jeffrey Weinberg (Dermatology, $113.8M) and Shahed Quyyumi (Endocrinology, $99.3M), who demonstrate significant financial relationships requiring detailed examination.

Specialty-Specific Audits: Deploy targeted reviews for Internal Medicine providers, who represent 7 of the top 10 highest-risk cases. Establish monthly monitoring for Endocrinology and Dermatology specialists showing disproportionate prescription volumes relative to industry benchmarks.

7.2 Policy Changes

Risk Threshold Adjustments: Establish formal review triggers at $10 million combined totals, capturing providers before they reach extreme outlier status. Current data shows the average high-risk provider handles $8.17 million in prescription costs, indicating this threshold would provide appropriate early intervention.

Disclosure Requirements: Mandate quarterly reporting for the 1,335 elevated-risk providers, requiring detailed justification for prescription patterns that exceed specialty norms by more than 200%.

7.3 Education Initiatives

Specialty-Targeted Training: Develop compliance programs specifically for Internal Medicine practitioners, addressing the correlation between payment relationships and prescription volumes. Focus on the 9,388 moderate-risk providers to prevent escalation to higher risk categories.

Peer Benchmarking: Create specialty-specific dashboards showing anonymous peer comparisons, helping providers understand where their prescription patterns fall relative to colleagues in similar practices.

7.4 Long-Term Strategies

Predictive Analytics: Develop algorithms to identify providers trending toward high-risk status before reaching critical thresholds. With 15,481 total providers in the system, early identification could prevent a significant portion from advancing beyond moderate risk.

Industry Collaboration: Establish cross-payer data sharing agreements to identify patterns that may not be visible within single-payer datasets, particularly for providers with combined totals suggesting multi-payer relationships.

Regulatory Framework: Advocate for standardized risk assessment criteria across healthcare systems, using current findings to inform evidence-based policy recommendations for federal oversight agencies.

These recommendations address both immediate risks and systemic vulnerabilities identified in the current provider population.

7.5 Appendix: Methodology

7.6 Methodology and Data Lineage

7.6.1 Methodology

This analysis examines financial relationships between healthcare providers and pharmaceutical companies using two primary data sources from the Centers for Medicare & Medicaid Services (CMS). The study covers the period from 2020-2024, providing a comprehensive view of payment patterns and prescribing behaviors during this timeframe.

Data Sources: - CMS Open Payments Database: Contains detailed records of payments made by pharmaceutical and medical device companies to healthcare providers, including research payments, consulting fees, and other financial transfers - Medicare Part D Claims Data: Prescription drug claims submitted under Medicare Part D, providing insights into prescribing patterns and medication utilization

Statistical Approach: The analysis employs descriptive statistics and correlation analysis to identify patterns in payment distributions and prescribing behaviors. Data aggregation occurs at the provider level, with payments and prescription volumes summarized across the study period. Statistical relationships are examined through cross-tabulation and trend analysis.

Key Limitations: - Analysis is limited to Medicare Part D prescriptions and may not reflect complete prescribing patterns for providers treating non-Medicare populations - Open Payments data represents disclosed financial relationships and may not capture all forms of pharmaceutical company engagement - Correlation analysis does not establish causation between payments and prescribing decisions - Data quality depends on accurate reporting by pharmaceutical companies and healthcare providers

7.6.2 Data Lineage

Pipeline Execution: - Pipeline ID: 20250902_153626 - Execution Date: 2025-09-02T15:36:26.719317 - Total Duration: 163.1 seconds - Validation Status: All Passed

Source Data Processing: - Provider NPIs: 19,969 records from northwell-npis.csv - Open Payments: 215,322 records spanning 2020-2024 - Prescriptions: 3,947,970 Medicare Part D claims from 2020-2024

Processing Summary: - Total Rows Processed: 4,183,261 - Intermediate Tables Created: 2 - Analysis Steps Completed: 1

The data pipeline successfully processed over 4 million records with comprehensive validation checks, ensuring data integrity throughout the analysis workflow.