

ISSUE BRIEF

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Rising Coding Intensity and Its Impact on Health Care Affordability

EXECUTIVE SUMMARY

Key Takeaway: Coding intensity is increasing commercial inpatient spending, even when care does not appear to be changing.

A Blue Health Intelligence® (BHI®) analysis of Blue Cross and Blue Shield (BCBS) commercial inpatient claims determined that hospitals have been increasingly documenting and coding admissions as clinically complex, without also documenting the expected increase in the care typically associated with clinical complexity. The shift in coding intensity seen in this BHI analysis aligns to public announcements by health care technology vendors and survey responses by hospitals who are applying Generative Artificial Intelligence (AI) to the patient's electronic health record (EHR) in the form of ambient listening and to the claims billing process with autonomous coding.

Specifically in maternity admissions, coding intensity contributed an estimated \$22 million in additional spending over the timeline of this analysis. This estimated increased spend is based on the billing of one secondary diagnosis code with limited evidence of corresponding treatment, providing an example of how discordant care where documentation-driven severity increases outpaced documented treatment impacts affordability without improving patient outcomes.

Across a subset of BCBS companies (Plans) representing approximately 62 million members, BHI's analysis identified approximately 9% increase per member in inpatient costs from 2023 to 2024. BHI estimates that ~20% of that increase is attributable to rising coding intensity without a corresponding increase in care provided.

BACKGROUND

Key Takeaway: Inpatient DRG reimbursement methodologies are vulnerable to coding intensity...

Hospitals are primarily reimbursed for inpatient care using diagnosis-related group (DRG) payments where each inpatient admission is assigned to a DRG. Admissions documented as more complicated through secondary diagnoses captured on the claim can qualify for higher-severity DRG tiers. These higher-tier DRGs are reimbursed at higher levels to reflect the additional resources expected when patients have complications or comorbidities.

Historically, inpatient claims and DRGs were compiled and billed through manual workflows: human coders searched charts, labs and clinical notes to identify primary and secondary diagnoses. National oversight and peer-reviewed research repeatedly found upward shifts in coding intensity under this model. A *Journal of the American Medical Association (JAMA) Network Open* cohort study found that increases in DRGs with major complications or comorbidities from 2012 to 2016 were associated with higher payments without corresponding increases in disease severity.¹ Similarly, the U.S. Department of Health and Human Services Office of Inspector General (HHS OIG) found a sustained trend toward higher-severity inpatient billing in Medicare from 2014 to 2019, noting that many of these cases were vulnerable to inappropriate payment.²

... and recent AI optimizations change the scale and speed of this dynamic.

Methods for documenting patient health status are changing as hospitals are increasingly deploying AI tools that reshape both workflows.

Ambient listening tools integrate with the provider EHR and automatically convert clinician–patient conversations into structured notes, increasing the volume and specificity of documented content.

Coding AI can then autonomously scan this expanded documentation alongside lab results, problem lists and notes from the EHR to propose additional billable diagnoses or higher-severity coding combinations that influence DRG assignment and, ultimately, the hospital bill.

While the hospital can achieve clear productivity gains by automating the documentation and coding processes, careful attention must be paid to ensure the newly billed diagnoses are reflective of the true acuity and level of treatment for that patient admission, otherwise DRG complexity and reimbursement can rise even when the care delivered is unchanged.

Not surprisingly, hospitals have been receptive to applying AI improvements to documentation and coding workflows. A 2024 HHS Office of the National Coordinator for Health IT (ONC) survey found nearly 33% of U.S. hospitals reported use of generative AI.³ In the fall of 2024, a separate *Journal of the American Medical Informatics Association (JAMIA)* survey of 43 non-profit hospital respondents noted that 60% were in the process of testing or had fully deployed ambient listening, while 45% were testing or fully deploying autonomous coding.⁴

RESEARCH OBJECTIVES

Against this backdrop, BHI examined whether patterns of rising coding intensity are identifiable over time in the BCBS System’s commercial inpatient claims data. BHI researchers evaluated whether growth in reported complexity is broad-based or concentrated among a small group of hospitals.

The objective of this analysis is to inform policymakers and health plan stakeholders about coding trends seen in the commercial market, rather than to make determinations about clinical appropriateness or provider intent in specific situations. To achieve this objective, two research questions were examined:

- Question 1: Are increases in complex coding seen generally across hospital systems or are they concentrated among a smaller subset of hospital systems?
- Question 2: Do hospital systems showing the largest growth in complex coding also have discordant care? Discordant care is defined as instances in which the severity of the patients’ coded conditions on the claim increase, but the treatments performed do not change in ways consistent with that severity.

RESEARCH APPROACH AND RESULTS

To examine these research questions, BHI analyzed deidentified commercial inpatient claims data with service dates from April 1, 2022, through March 31, 2025, for patients whose primary coverage was with a participating BCBS Plan. Based on previously referenced surveys, this timeline spans a baseline period prior to significant AI adoption in health care (2022 - 2023) through more significant deployment of AI optimizations by early-adopter hospital systems (2024 - 2025).³ Claims with service dates in the first quarter of 2022 were excluded to minimize COVID-related distortions.

To evaluate the level of coding intensity in claims, BHI used the DRG reported on the claim to differentiate complex vs. non-complex admissions and limited the analysis only to DRGs that can be coded with varying degrees of complexity. Complex cases were defined as inpatient admissions coded with a DRG that indicated complications or comorbidities (CCs) or major complications and comorbidities (MCCs) were present, resulting in a higher-severity DRG being coded.

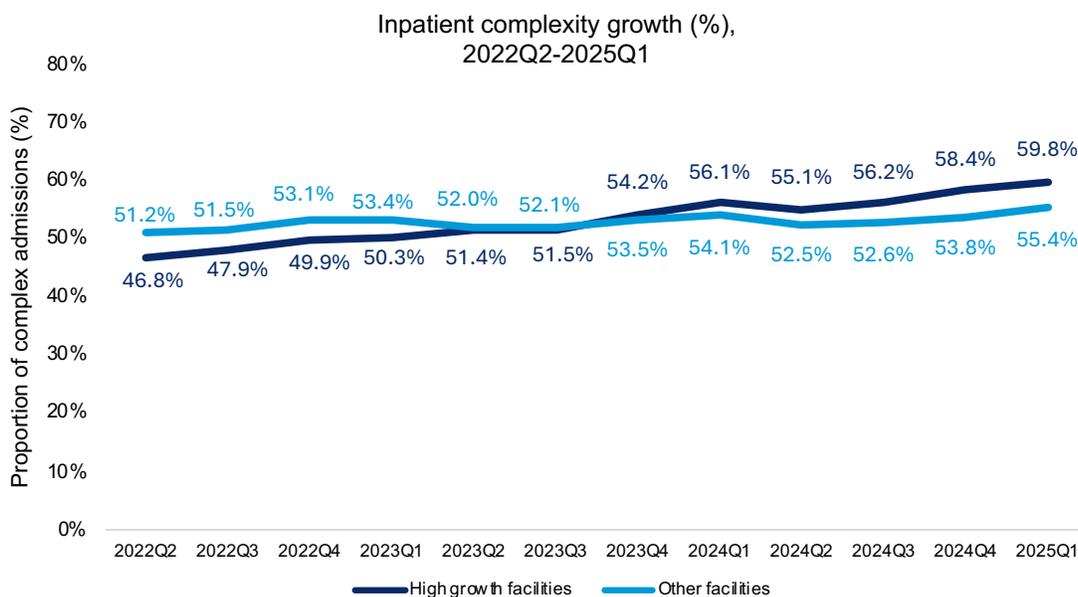
To isolate the financial impact of rising coding intensity, a case-mix analysis was performed. Specifically, total costs under the observed distribution of complex and non-complex inpatient admissions in the 2024-2025 period were compared to the costs that would have occurred had the case mix remained at its baseline level in the 2022-2023 period. The difference between these estimates represents the incremental spending associated with increased coding complexity, independent of price changes.

To investigate the first research question, analyses examined how the proportion of inpatient admissions coded as complex changed over time and how this varied across hospital systems.

Key Finding: Coding intensity increased over time and was concentrated among 10% of hospitals in the sample.

As shown in Figure 1, two groupings of hospitals emerged in this analysis. Ten percent of hospitals who had the biggest jump in complex DRGs saw their proportion of inpatient admissions coded as complex increase to 59.8% by Q1 2025, a 13.1 percentage point increase vs the 46.8% observed in Q2 2022. The remaining 90% of hospitals had a higher baseline of complex admission in Q2 2022. While they still saw a 4.2 percentage point increase of inpatient admissions coded as complex over this three-year period, their pace of change was not as dramatic as the high growth hospitals. The variation seen between the 10% of hospitals showing high growth relative to the rest suggests that there is something happening in these hospitals to drive substantial changes in a short period of time.

Figure 1: Inpatient complexity growth, participating BCBS Plans, 2022Q2-2025Q1



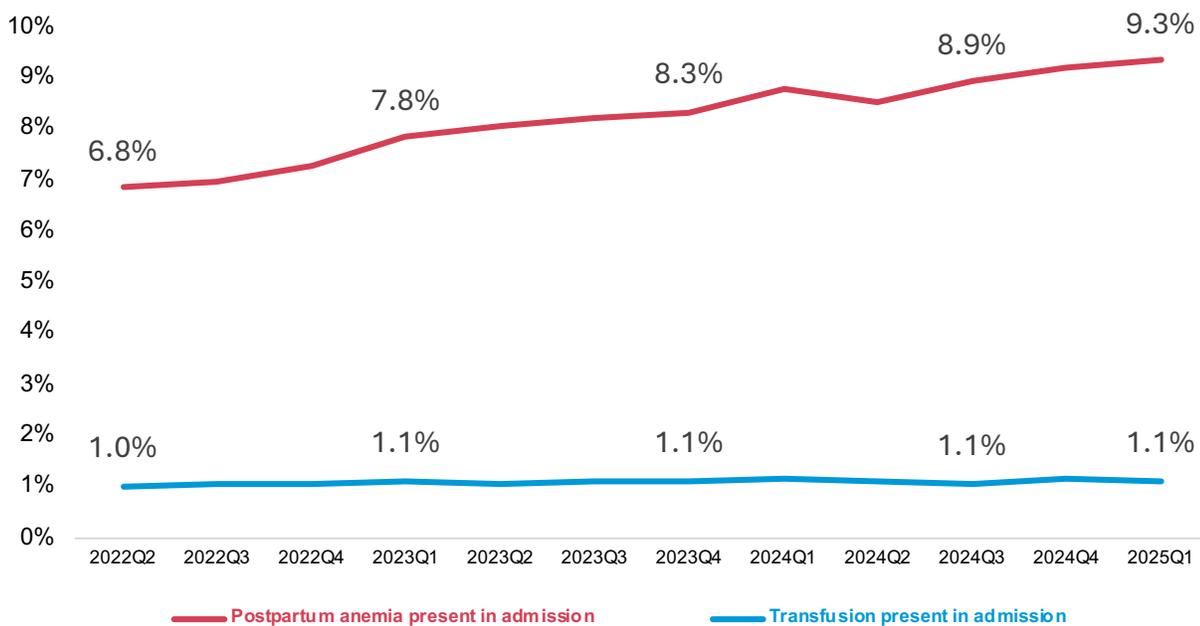
Note: Hospitals are paid more for cases with MCC or with CC. BHI calculates complexity as the count of inpatient visits with CC or MCC / total inpatient visits DRGs that have multiple severity tiers (i.e., DRGs where a case can be classified as having a CC or MCC). Hospitals included have a minimum of 500 admissions over the observation period. High growth facilities are the top 10% of facilities that were most complex over this analysis period.

Within these complex cases, maternity admissions (DRGs 783-788, 805-807, 768, 796 – 798, and 805 - 807) emerged as an area where reported complexity significantly increased – in particular, admissions coded with acute posthemorrhagic anemia (ICD-10 D62). For simplicity, acute posthemorrhagic anemia will be referred to as postpartum anemia in the maternity context.

In the case of maternity admissions, postpartum anemia primarily happens when postpartum hemorrhage (heavy bleeding after delivery) causes enough blood loss that hemoglobin levels drop. This results in the body not having enough red blood cells to carry oxygen. When this occurs after childbirth, anemia can lead to weakness, dizziness or shortness of breath until treated.

To address the second research question, admissions with a diagnosis of postpartum anemia were examined to understand if the reported complexity of the patient aligned with the treatments administered to the patient. Treatment for postpartum anemia often involves a blood transfusion,⁵ which can be reliably identified in claims data (ICD-10 procedure codes 30233N0 and 30233N1 and revenue codes 38x and 0391). The analysis examined how the rate of coding for postpartum anemia changed relative to blood transfusions.

Figure 2: Coding for postpartum anemia and transfusions between 2022Q2 – 2025Q1



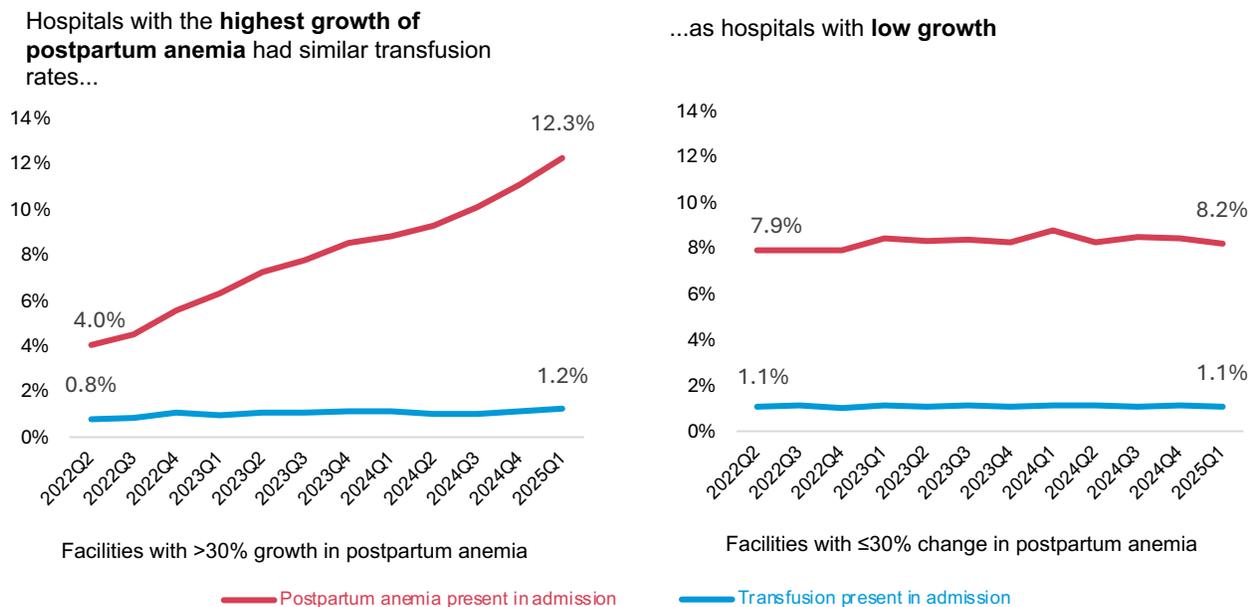
Note: Postpartum anemia is defined as ICD-10 diagnosis code D62 (Acute Post-Hemorrhagic Anemia) present in hospital claim for Maternity care (defined as MS-DRG codes: Caesarean (783-788), Vaginal w/O.R. procedures (768), Vaginal w/sterilization/D&C (796-798), Vaginal w/o sterilization/D&C (805-807)). Transfusion is defined as presence of one or more of the following codes: ICD-10 30233N0; 30233N1; UB-04 revenue codes (038x, 0391)

Key Finding: The reported level of severity for maternity admissions increased but the intensity of treatment did not.

In hospitals with the largest increases in postpartum anemia, defined as those with $\geq 30\%$ growth in the proportion of maternity admissions with ICD-10 code D62 present, transfusion rates remained flat, strengthening the case that the observed change is consistent with increased **coding** intensity rather than a sudden shift in hemorrhage severity in those hospitals (see Figure 3). The high-growth hospitals went from

4.0% of their maternity admissions being coded with postpartum anemia in Q2 2022 to 12.3% by Q1 2025, while low-growth hospitals saw a very small increase from 7.9% in Q2 2022 to 8.2% by Q1 2025. Among both high-growth and low-growth hospitals, transfusion rates remained relatively flat: The 8.3 percentage point rise in coded anemia over this short period of time was only associated with a 0.4 percentage point increase in transfusions. Again, this suggests a discordance between the reported level of complexity of the patient and the treated condition.

Figure 3: Comparison of postpartum anemia and transfusion coding between high- and low-growth hospitals, 2022Q2 – 2025Q1



Note: Postpartum anemia and transfusion rates at two sets of hospitals. The left are hospitals with > 30% growth in postpartum anemia; right are hospitals with ≤30% change in postpartum anemia (all hospitals have >250 maternity admissions).

To further investigate the rapid rise in claims coded as postpartum anemia, one BCBS Plan conducted an audit of maternity cases at one hospital system in their network that was one of the largest national outliers in complex coding growth identified in this BHI study. The goal of these audits was to determine if the severity of the patient documented on the claim matched what was documented in the patient’s chart. The senior clinical executive at the Plan found that,

“From 2022 to 2024, one hospital system in our market increased its use of the diagnosis of acute post-hemorrhagic anemia (D62) by 5 percentage points across all types of admissions (5.8% vs 10.9%). This rate of increase was six times higher than what we observed across all other hospitals in the same market (4.5% vs 5.1%). In maternity admissions, this hospital system increased coding of D62 by 21 percentage points (from 2.9% of admissions to 23.5%) over the same period — a rate of increase that was more than seven times higher than all other hospitals in our market. **To assess clinical validity, we conducted an audit of maternity cases in collaboration with our own board-certified OB-GYN and less than 20% of cases met established clinical criteria for postpartum anemia.**”

MARKET CONTEXT – GENAI OPTIMIZATIONS

The timing, concentration and diagnosis-specific nature of the observed increases in coding intensity coincide with the growing deployment of AI-enabled documentation and revenue cycle optimization tools within hospital systems.



Over the study period, hospitals increasingly adopted technologies such as ambient clinical documentation, as noted in Exhibit 1 listing public press releases from vendors and health systems. One vendor who sells ambient listening to hospitals claims their solution helps hospitals make an additional \$13,000 per clinician annually.⁶ The benefits of ambient listening to physician satisfaction and operational improvements for hospital systems are significant, but further study is required to evaluate impacts on health care affordability under the current reimbursement models.

Vendors selling Coding AI and automated chart review platforms that systematically scan the medical record to identify additional billable secondary diagnoses also experienced significant growth during this study period. One vendor who sells Coding AI solutions markets a 5:1 return on investment of their product on day one, without any changes to existing workflows.⁷ Additional examples of publicly available case studies and press releases from Coding AI vendors and partnering health systems are noted in Exhibit 2.

In short, AI can maximize reimbursable severity, enabling coding intensity to rise more quickly and more selectively than would be expected from changes in patient acuity alone.

CONCLUSION

This analysis finds that inpatient coding intensity in the commercial market increased materially over a short period, with clear implications for affordability. The increase was uneven with the top 10% of high-growth hospitals driving much of the rise in complex coding, pointing to shifts in documentation and coding practices rather than broad changes in patient acuity.

A clear signal of discordancy between complex coding and documented treatment appears in maternity care. A subset of hospitals sharply increased coding for postpartum anemia, driving higher reported complexity, while their blood transfusion rates remained flat. The disconnect is reinforced by a BCBS Plan audit at one outlier system where less than 20% of maternity admissions coded with postpartum anemia met clinical criteria.

These patterns have real financial impact. Within the participating BCBS Plan's commercial inpatient population in this analysis alone, per member costs increased by 9% between 2023 and 2024. Coding intensity is estimated to contribute about 20% of this increase. If this dynamic extends more broadly, it will further accelerate hospital spending and erode affordability for employers, families and health plans.

The timing, concentration and diagnosis-specific nature of these increases coincide with the growing use of AI-enabled documentation and coding tools that scan records to identify additional billable conditions and optimize DRG assignment at scale. As adoption expands, payment models will increasingly reward more intensive coding unless Plan safeguards or adjustments to the DRG payment system keep pace. Greater transparency and clearer expectations tying coded severity to objective clinical indicators and treatment are needed to ensure payment reflects the true complexity of delivered care.

Exhibit 1 - Ambient Listening Press Releases

*These are example press releases from vendors selling ambient listening to hospital systems.

Vendor	Hospital System	Link	What They Announced
Abridge	The University of Kansas Health System	Abridge Announces Partnership in The University of Kansas Health System's 140+ Locations, the First Major Rollout of Generative AI in Healthcare	Most significant rollout to date of generative AI in health care
	Emory Healthcare	Abridge and Emory Healthcare Collaborate on Medical Conversations	Enterprise-wide adoption agreement.
	UPMC	UPMC Goes All-In on Abridge, Scaling AI Platform Enterprise-Wide	Expansion of existing Ambient Listening roll out to full enterprise
Microsoft / Nuance DAX Copilot	WellSpan Health	WellSpan Health Advances Its Leadership in Delivering Exceptional Provider and Patient Experience with Nuance DAX Copilot	Expanded deployment at WellSpan
	Tampa General Hospital	Tampa General Hospital Deploys Artificial Intelligence Tools to Elevate Patient Experience	Initial deployment at TGH
	Northwestern Medicine	Northwestern Medicine deploys DAX Copilot embedded in Epic within its enterprise to improve patient and physician experiences	Deployment announcement noting downstream improved financial outcomes
Commure / Augmedix	HCA Healthcare	HCA Healthcare Collaborates With Google Cloud and Augmedix to Bring Generative AI to Hospitals	As part of a larger Google Cloud announcement on Generative AI, this also notes HCA's initial use of Augmedix (now Commure)

Exhibit 2 - Coding AI Press Releases

*These are example press releases from vendors selling Coding AI to hospital systems.

Vendor	Hospital System	Link	What They Announced
Fathom	Cedars-Sinai (<i>investment</i>)	Cedars-Sinai backs Fathom	Health system named as an investor
CodaMetrix	Mass General Brigham	CodaMetrix closes \$55M Series A to autonomously power medical coding, boost health system revenue cycles	MGB participated in the round; release also describes CodaMetrix' health-system deployments for coding automation
	Yale Medicine	CodaMetrix closes \$55M Series A...	Yale Medicine listed as a participant in the Series A
	Henry Ford Health	CodaMetrix closes \$55M Series A...	Listed as an existing partner health system using CodaMetrix for AI-driven coding automation
	University of Colorado Medicine	CodaMetrix announces \$40M Series B...	Listed as a health system partner for autonomous coding across specialties
	Mount Sinai Health System	CodaMetrix announces \$40M Series B...	Listed as a health system partner for autonomous coding
	University of Miami Health System	CodaMetrix announces \$40M Series B...	Listed as a health system partner for autonomous coding

SmarterDx	University of Arkansas for Medical Science	How UAMS used clinical AI to uncover \$5.3M	Vendor case study naming UAMS and describing CDI/pre-bill workflow impact of \$5.3M net new revenue per year
	Novant Health	Novant Health doubled their ROI forecast	Vendor case study naming Novant; focuses on scaling CDI outcomes/ROI
	McLaren Health Care	How McLaren used clinical AI to uncover \$11.3M annually	Vendor case study naming McLaren; revenue integrity via AI-driven review
Ambience	John Muir Health	Announcing full enterprise rollout after initial launch in 2023	4% increase in coding complexity through more precise documentation
Arintra	Mercyhealth	Mercyhealth transforms RCM with Arintra	Customer-naming press release describing adoption and results (5.1% revenue uplift)

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